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NEWS SUMMARY

A SCHEME for housing 7,000 people in the Barbican area of the City has been prepared. p. 623

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FIRES CAUSED BY ELECTRICITY are increasing steadily, states a new DSIR report. p. 643

MEMBERSHIP OF THE AUBTW has fallen in the past year, the President has stated. p. 645

A NEW CONCEPT IN THEATRE DESIGN has been described by Mr. Norman Branson, ARIBA p. 647

STANDARDS OF LAYOUT AND DESIGN in Scottish housing schemes are criticised in the Department of Health's annual report. p. 667

PROSPECTS FOR HIGH BUILDING

IN their plans for the development of the South Bank, the London County Council have made provision for an office building of over 300 ft., and this is to be erected by the Shell Petroleum Company. The scheme for the Elephant and Castle includes a proposed tower building of comparable height; in this case the project is not so far advanced but here again it is hoped that the building will be erected by a private developer. The LCC themselves have actually built some multi-storey residential blocks at Roehampton, and plan others.

Do these developments presage a general policy of high building in London? In other words, is London likely in the foreseeable future to become a city of skyscrapers? It is significant that the LCC Town Planning Committee should have seen fit to issue a policy statement on the subject. This statement—which was published in full in our issue of May 18—shows that the LCC are not in principle averse to high buildings on suitable sites; the statement mentions offices, flats and hotels as the most suitable for vertical development. But, taken in conjunction with the Council's previously announced planning policies, the statement leads to the conclusion that really high buildings are likely to be the exception rather than the rule.

The problem cannot be looked at solely from the aesthetic point of view, important as that is. In the County of London Plan (1943), Forshaw and Abercrombie pointed out that the height of buildings affects the density and intensity of the use of land and the consequent value of land, as well as the architectural appearance of the town. The first two problems have, however, been dealt with to a considerable extent by the LCC Development Plan. So far as residential buildings are concerned, the Plan shows six density zones ranging from 200 persons an acre to 30 persons an acre. These are intended to be averages, and densities above the average for the zone may be permitted on high ground and near a major open space, but the effect of this relaxation is limited by the fact that lower than average densities are to be enforced in parts of Hampstead, Highgate and Blackheath.

As regards non-residential buildings, the Development Plan states that in considering applications for planning permission, the LCC will have regard to the plot ratio, that is, the ratio of floor space to site area; these plot ratios vary from 5½ to 1 in parts of the City to 2 to 1 over most of the county. Coupled with the Council's daylighting standards, the plot ratios substantially limit the intensity with which land can be built up for commercial and industrial use.

In their recent statement, the LCC emphasise that there is no question of permitting any departure from the plot ratio and other planning standards. This is a sound warning, for the Council can hardly be expected to abandon these standards which are essential if the attempt to reduce congestion in London is to succeed. The enforcement of these standards must obviously restrict the opportunities for high buildings. But, within a given density, the plot ratio and daylighting standards may to some extent encourage higher buildings in the form of an open spine or tower rather than a lower, bulky type of building.

High buildings are, of course, proportionately more expensive to erect than lower buildings, and this factor must tend to offset the influence of the plot ratio in encouraging more open vertical development. The LCC think that, in the case of offices and hotels, developers may nevertheless be willing to incur the additional expense because of the resulting prestige and advertisement value. Considerations of prestige and advertising do not arise in the case of residential building, and in view of the increased cost it seems doubtful whether private developers would regard high blocks of flats as an economic proposition. Local authorities are able to build high blocks because of the very substantial Government subsidies, but there seems little justification for such expenditure except insofar as it makes it possible to provide a higher proportion of small houses and gardens in the area concerned. A recent LCC survey shows that in spite of the advantages of light, air and view attaching to the upper storeys of tall blocks, the great majority prefer for a variety of reasons to live in the lower storeys. Some further thought needs to be given to the question of how

far the Government and the local authorities are justified in saddling the public with the cost of heavy subsidies to provide a type of residence in small demand.

There remains, of course, the undoubted fact that in suitable surroundings a vertical feature can be most attractive architecturally. The LCC statement provides a useful analysis of the aesthetic issues involved, and this should be of considerable assistance to building owners and architects in deciding whether to submit plans for high building in conformity with the plot ratio. On the other hand, the statement is little more than an analysis of the issues involved; it is very far from being a code of practice. The decision on any particular application will depend to a very large extent on the personal opinions of the officers and members of the Planning Committee. The developer can, of course, appeal to the Minister, but the Ministry's handling of amenity issues has often (to put it mildly) been difficult to understand. All this is to some extent inherent in the nature of the subject, and an attempt to lay down hard and fast rules might be even less satisfactory. But some firmer guidance than exists at present is necessary. It is to be hoped that the LCC will improve on the good start they have made by considering the possibility of a code of standards.

BRITISH CIVIL ENGINEERING

A FINELY-PRODUCED volume entitled "The British Civil Engineering Contracting Industry: Illustrated History," has lately been issued by the Federation of Civil Engineering Contractors*. Although a brief reference is made in the introduction to some of the engineering achievements of remote civilisations, and the early chapters have something to say about the canals, railways, docks and harbours and other early engineering developments in this country, the book, as Sir George Burt, KBE, MICE, at the time of writing President of the Federation, says in his preface, is really "an illustrated survey of the part played by the British civil engineering contracting industry in an age of great constructional enterprises." Under the main headings of Transport and Communications, Fuel and Power, Public Health, War, and Industry, some 26 articles cover most interestingly the whole field of contemporary civil engineering. There are over 270 illustrations, many of them such as the Forth Bridge in course of construction, the Mulberry harbours and wartime fortifications on land and sea, being of historic interest.

The book is written in excellent English (the identity of the author or authors is not disclosed) and from the fact that it is free of all but easily understood technicalities, and that there are no technical drawings, the assumption is that it is mainly intended to serve publicity purposes, and well indeed does it do so. No one turning over the pages of this handsome volume could doubt the capacity of the British civil engineering industry to cope with any kind of work.

At a time when the pressing need of our economy is for more and more exports, it is useful to be reminded, by text and illustration, of the part that our civil engineering industry has long played in this respect, and that British contracting skill and experience are increasingly in demand overseas. As Sir George Burt points out, in the 200 years or so spanned by this volume civil engineering contracting has developed from isolated undertakings into an industry vital to the nation's well-being and to development abroad.

Apart from the advances made in scientific design and constructional techniques, the key to progress is obviously mechanisation. A dramatic illustration of the economies achieved through mechanisation is given in the chapter on Canals, where it is recorded that in the early nineteenth century the average price of excavation was 4d. per cu. yd., rising by 1d. or 2d. later owing to the inflation produced by the Napoleonic wars. Labourers' wages were then about 2d. an hour, yet to-day, when they have risen over 20 times, the cost of similar excavation has only doubled.

The chapter on Airfields, which records something of the industry's constructional achievements during the war, describes the quick results produced by the use of mechanical spreading and finishing machines fed with concrete from large central batching and mixing plants. Main runways 2,000 yds. long, 100 yds. wide and 1 ft. thick were laid in ten weeks, and outputs which had previously taken a week were achieved in a day. Between 1939 and 1945 some 500 airfields were constructed with runways, taxi ways and hardstandings equivalent to 3,000 miles of dual carriageway road. The industry could soon provide the new roads so urgently needed if the Government gave the word.

The Federation of Civil Engineering Contractors is to be congratulated on the production of a splendid volume which, in recording some of the industry's outstanding achievements, clearly shows its capacity for continuing expansion.

* London: Romney House, Tufton Street, SW1. Price 3 guineas net.

Notes of the Week

Another Barbican Scheme

THERE is some evidence to show that the City is in danger of being oversupplied with warehouse and office accommodation; hence the suggestion that some thirty acres of the Barbican area might be considered for residential development. A comprehensive scheme for this, envisaging seventeen blocks of flats (including three 30-storey towers) to accommodate between 6,000 and 7,000 persons, a cultural and recreative centre providing a theatre, a concert hall, an open-air amphitheatre, gymnasium, swimming bath, playgrounds, shops and many other features, and providing also new premises for three city schools—the City of London School, The City of London School for Girls, and the Guildhall School of Music and Drama—is now under consideration by the Court of Common Council. A view of a model of the scheme, and an official description are on facing page.

A great deal of thought has obviously been given to this scheme, but doubts remain. The precinctual type of plan has been rightly adopted, but the disposition of the bulk of the residential accommodation in the form of two immense "quads" is rather unimaginative. A large open amphitheatre, too, is a doubtful feature in a scheme of this kind, and in any case it is not well placed within the semi-circle of flats. The cost is estimated at nearly £10,500,000, apart from the cost of the site, which is put at about £4 10s. 0d. per square foot net, excluding public ways. Even if it be thought appropriate to the City there is likely to be much knitting of brows to discover whether so ambitious and costly a scheme can pay its way.

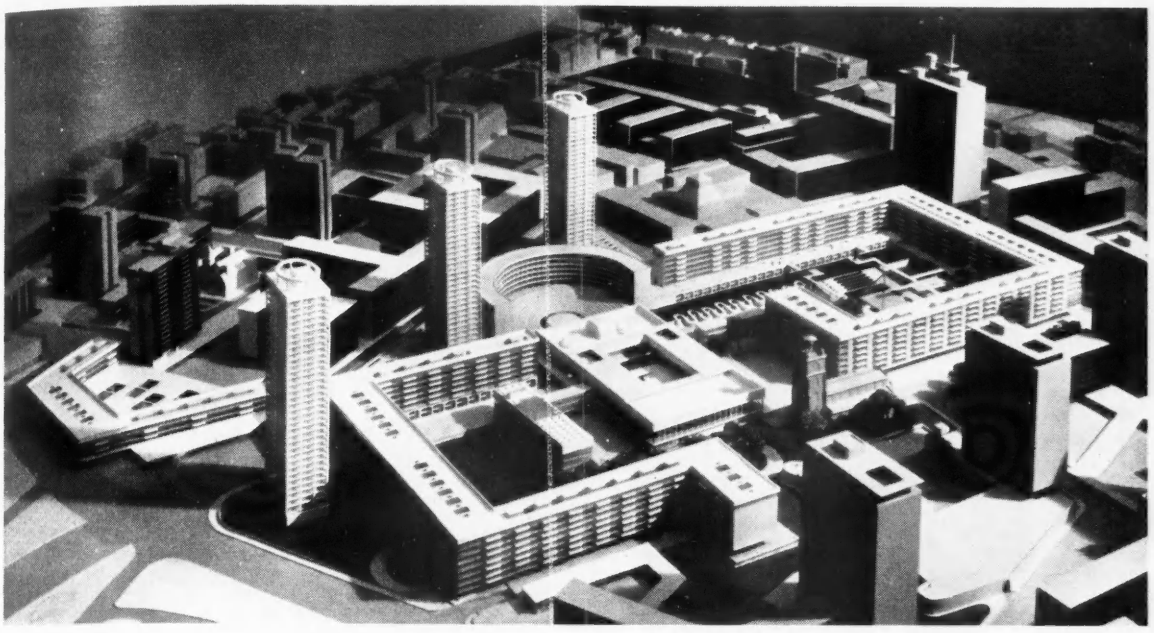
"The Homes of the Royal Academy"

UNDER this title the Royal Academy of Arts, London, has just published a well-produced booklet by Mr. Sidney C. Hutchinson, FSA, the Librarian, describing the various "homes" occupied by the RA since its foundation in 1768. The first of these was in Pall Mall, the second was old Somerset House, the third the present Somerset House, of Sir William Chambers, the fourth the National Gallery of William Wilkins in Trafalgar-square, and the fifth and last Burlington House, Piccadilly, adapted and enlarged to the designs of Sydney Smirke, with buildings on the east, south and west sides of the courtyard by Banks and Barry. The interest of the booklet, which is extremely well-written, is enhanced by numerous illustrations, including eight pages of reproductions on art paper of contemporary engravings, water-colours, etc., those of Burlington House before its conversion being of particular interest. No price is given.

Rebuilt Falaise

A PAGEANT was recently held in Falaise in Normandy. The background, which was floodlighted, was the Norman Feudal Castle. This survived the almost complete ruin in 1944 of the little town

(*Notes continued on page* 624.)



A model of the proposed residential development scheme (coloured white) within the Barbican area.

BARBICAN REDEVELOPMENT: A RESIDENTIAL SCHEME FOR THE CITY OF LONDON

A RESIDENTIAL scheme for housing nearly 7,000 people within the Barbican area, which has been prepared for the Corporation of London by Messrs. Chamberlin, Powell and Bon, was announced to representatives of the Press at Guildhall on May 25. The scheme forms part of the City Corporation's proposals for the comprehensive redevelopment of the Barbican area of the City, which was almost completely devastated during the war. It may be regarded as a rival to the New Barbican Committee's scheme of redevelopment, which was rejected by the City Corporation and was the subject of a planning appeal last January, the result of which has not yet been made known by the Minister of Housing and Local Government. At the time of the announcement of Messrs. Chamberlin, Powell and Bon's scheme last Friday it had not been considered by the City Corporation, who had not therefore expressed any opinions on its merit, but it was due to go before the Court of Common Council yesterday (May 31). Together with their report, the consultant architects illustrated the scheme by means of a small exhibition of photographs, plans and models.

The detailed proposals set out in the report entitled "Barbican Redevelopment," refer to the "non-commercial" area within the Martin/Mealand scheme which lays down town planning proposals (including commercial and office development) covering the part of the City extending from Guildhall to Barbican and Chiswell-street and from Aldersgate to Moorgate. The "non-commercial" part of the Martin/Mealand scheme extends from St. Giles Church to Barbican and from Aldersgate to Moor-lane. In addition to relating their proposals for the "non-commercial" area to the Martin/Mealand proposals for commercial development flanking route 11 and the east side of Moor-lane, Messrs. Chamberlin, Powell and Bon have been required by their terms of reference to consider how the land might be developed which lies north of Barbican up to the City boundary; the total area of ground which is the subject of the present report is therefore a little over 30 acres.

The architects concluded that there were certain of the City's needs as yet unprovided for which might be met by including in their proposals: (a) residential accommodation for about 6,000 to 7,000 people, together with a large number of garages for these residents; (b) new buildings for the City of London School, the City of London School for Girls and the Guildhall School of Music and Drama; (c) a large area of open space.

The underlying idea of the design is to satisfy these three requirements by turning the existing war devastated area into a garden surrounded by flats and containing the schools. The interior of the layout is intended to be preserved for pedestrians and traffic would be excluded. The flats are concentrated into a few high blocks and a series of long, compactly planned terrace blocks which leaves much of the ground free for garden development.

Grouping of Buildings

To avoid monotony in such a large development, blocks of buildings are arranged in groups. The group of three 30-storey residential towers south of Barbican, echoing the high commercial buildings which form part of the Martin/Mealand proposals on the south and east, complete the series of vertical elements which surround the central part of the layout; the lower terrace blocks are grouped to embrace or define certain parts of the garden development: the schools are grouped in a series of relatively low buildings round a cloistered quadrangle forming the heart of the whole scheme which it is intended should become a cultural centre to the neighbourhood.

The various inter-related spaces created by the grouping of different buildings are linked by other elements in the composition at or near ground level. A prominent feature linking the office blocks which flank route 11 and Moor-lane are the podia which provide a pedestrian circulation level some 20 ft. above ground. This feature is echoed round the base of two of the towers of flats, in the terraces which project into the garden at the eastern half of the site and in the podium from which rise the terrace blocks north of Barbican. This podium level, therefore, forms a continuous feature linking together the residential blocks and the commercial development.

Vehicle access to the estate would be obtained from the perimeter roads. Extensive garages at ground and basement level are provided with direct access from surrounding roads.

In preparing their design, Messrs. Chamberlin, Powell and Bon have consulted Mr. Ove Arup on structural matters, Mr. H. J. Knox concerning the installation of engineering services, Messrs. Davis, Belfield and Everest, quantity surveyors, concerning the cost of building and site development, and Messrs. Goddard and Smith, estate agents, concerning the prospects of letting flats in a residential estate as designed.

The proposals are for the creation of a self-contained residential neighbourhood enjoying its own amenities and services, which would at the same time become a cultural centre for the City, complementary to the large business and commercial districts. It is of interest that the boundary of the site nearly coincides with the boundary of the Parish of St. Giles-without-Cripplegate. The population of this parish in 1851 was 14,361, whereas in 1951 it had fallen to 28. If the proposals contained in the architects' report are carried out, the population would be about 6,700.

The capital cost of the scheme, excluding site values, is estimated at nearly £10½m.

SHAKESPEAREAN FESTIVAL THEATRE, CANADA.—A model of the proposed new permanent Shakespearean Festival Theatre to be built at Stratford, Ontario. The design was inspired by the temporary tent theatre there. It is hoped that the new building will be ready in time for the 1957 festival. The architects are Rounthwaite & Fairfield, of Toronto. A proposed new British theatre, the Questors, is described on page 647.

which was built on a cliff, or "falaise," where there have been buildings for over a thousand years.

The castle itself has twelve towers and two entrances. There are smaller courses and neater bonding than in Norman buildings like Durham Cathedral or castles in the south of England. According to the legend, Duke Robert the Devil looking from a wall of his castle saw below a fountain in the suburb of Val d'Ante, where the daughter of a tanner was washing. She so enchanted the Duke that in time she became the mother of William the Bastard, better known in this country as William the Conqueror.

Visitors to Falaise this summer will find much of the town has been rebuilt, but the fighting during the fierce battle of the Normandy campaign meant the complete destruction of two churches, both of architectural fame. The Church of Saint-Gervais was a combination of Romanesque and Gothic. The Church of the Trinity had transepts of pure Norman Romanesque, a choir of the 16th century, and a Renaissance porch.

Marino Marini

THE MAY SUNSHINE seems to have brought out a crop of art exhibitions overnight, writes Marjorie Morrison. Take your choice—Russian, German, Spanish or Italian. I have chosen Marino Marini at the pleasant little Hanover Gallery where you do not pay to go in but buy, inside, a rather expensive catalogue for the benefit of the British School in Rome.

Marini is still obsessed by the equestrian statue, the dancer and the juggler. We all know his horsemen and horses by now—the man, astride the wrong way round or sliding off, the horse with its head on the ground and its legs gathered in beneath in a prolongation of movement; there is no doubt that Marini is the kind of master who can create a moment of intensity, transmitting his emotion to us by fixing the intangible in material forms. His stylised forms, however, remain humanistic and rooted in tradition —Greece, Rome, the Renaissance and a hint of the T'ang Dynasty are all there underneath.

Apart from horses, No. 4 is most fascinating. A classical bronze figure, it is armless and listed, very simply, as "Juggler." However, the first reaction is not to wonder how he can carry on his profession without arms and hands, but to marvel how the absorption of the head and the tension of the legs and feet convey all that is not there. Marini's paintings are lovely, too. In oil, but looking like *gouache*, they are very exciting in colour. The exhibition closes after June 16.

Will England be Smothered ?

SIR HUGH CASSON, FRIBA, is visiting various parts of England to describe, in a series of six BBC Home Service talks called "A Journey Through Subtopia," the effect of drab and depressing "development" in town and country, and what may ensue. They will be heard on Wednesdays from June 6. In his first talk Sir Hugh will tell listeners what is happening in North Oxfordshire; in later talks he will deal in turn with Norwich, Croydon and Crawley, the North Yorkshire coast, Dartmoor and Lancashire. He will also give the views of people he meets in this cross-section of England. Will England really become the kind of jungle of wire, concrete and brick that some people fear, taking the soul out of the cities and smothering the countryside, and if so, what can be done about it? Sir Hugh gives his views on the future as well as the present in what promises to be an interesting series of broadcast talks.

New Guide Books

Two new official guide books for the Royal Palaces of Hampton Court and Kew respectively have just been issued by H.M. Stationery Office for the Ministry of Works (price 1s. 6d. each). They are most attractive productions, informative, well-written and well-illustrated. The former, by Mr. G. H. Chettle, OBE, FSA, Inspector of Ancient Monuments, is a revision of an earlier guide; the latter, by Mr. John Charlton, MA, FSA, is the first comprehensive guide to the smallest of the Royal Palaces. It is enlivened with some charming line drawings by Mr. Eric Fraser and a plan of Kew Gardens by his son Mr. Geoffrey Fraser.

The Litter War

DURING the recent Bank Holiday Liverpool Corporation parks department set out to beat the "litter bugs," writes a correspondent. They erected huge cages of wire netting in the parks round which were posted notices appealing to the public to place their litter therein. But mothers found what they considered a much more useful purpose for them, and within a short time the cages were converted into creches in which infants spent an enjoyable Bank Holiday free from any danger while their mothers also enjoyed themselves knowing their offspring were safe. And most of the litter found its way on to the parks as usual.

"Thank you for the drawings explaining the quantities—could you kindly send someone along to explain the drawings?"

SCULPTURE AT THE RA SUMMER EXHIBITION

Reviewed by
MARJORIE MORRISON

HAS the Royal Academy gone to the dogs this year or has it put on one of its best shows ?

The answer depends on whether you range yourself alongside Sir Alfred Munnings and tradition, or support the modern brigade with its addiction to the meaty interiors of butchers' shops. Having, mercifully, only the sculpture to consider here, there is no need to take sides in the battle. The sculpture exhibits are so orthodox that they could not cause a moment's anxiety to the most reactionary Academician. Only in choice of material does the spirit of adventure creep in. Here we have cemented iron, metal composition, and copper sprayed plastic-wood. There are also rare and beautiful woods and exotic marbles.

Occupying the centre of the Central Hall, focal point of the whole exhibition, Maurice Lambert's bronze of Margot Fonteyn has been besieged by spectators and the critics have starred it as the piece of the year. How good is it really ? The trouble is that the magic of Margot Fonteyn is so pervading that it makes a real assessment of the figure, as a work of art, very difficult to arrive at. Two things are certain: that as a presentation of actuality it could hardly be bettered, and that it is beautifully modelled, especially the back and arms. It is not so certain that the use of wire mesh, to simulate the material of the tutu and the bodice edging, is quite happy. It seems to detract from the classic quality of the figure. Not very satisfactory, either, is the rather horizontal line of the ballet skirt which tends to interrupt the rhythm of the pose. But all things considered it is very right that there should already be a red star on the base and we hope it may mean a permanent place in one of our galleries for this record of a great ballerina.

It is interesting to go straight from Margot Fonteyn into the Lecture Room to look at another rendering of a dancer.

Dame Margot Fonteyn—statue in bronze by Maurice Lambert, RA. (Bought by the Chantrey Bequest.)

This is a small uncomplicated bronze, not more than twenty inches high, by Dora Gordine. The dancer is shown in the fifth position, the pose unobscured by skirt or draperies. A fine piece of work in which Miss Gordine has captured the illusion of movement rather than the movement itself.

Looking around among the larger exhibits for the more imaginative work, for something that is not just a copy of live form, we find an interesting example of the work of Willi Soukop. Called "Wonderment" it is an arresting composition of a kneeling woman, cloaked, with hands clasped on her breast, and all coloured a harsh streaky silver. It is representational up to a point although the sculptor has distorted and intensified the human form in order to express emotion. On the other hand that very clever and sincere young artist Sydney Harpley uses quite different tactics in order to say what he wants to say. His method is intense realism (or is it neo-realism?), and stressing of character. His "Little Girl" is well placed in the Central Hall, and what a little girl! Sitting on the edge of a box, legs stretched out in front of her, toes turned in and her hands deep in the pockets of her coat, dragging it out of shape. A very plain child, not even nice, but intent, very intent, on something that we the audience don't know about. There is something real and touching about this figure which lifts it right out of the good and competent class.

Little Girl—statue in bronze by Sydney C. Harpley.

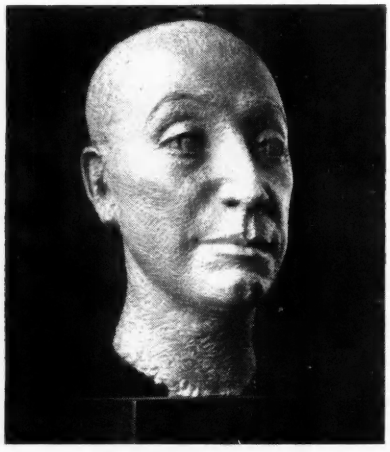
Readers of this newspaper are naturally interested in architectural sculpture, but this year there are singularly few examples to report on and they are mostly rather dull. Quite the best are the models for a pair of angels, to be carved in wood for Guildford Cathedral, by Mary Spencer-Watson. These are beautiful lyrical compositions, but unfortunately there is no indication of how they will relate to the building. Last year we noted the architectural quality of this artist's work. Harold Youngman shows St. Aidan, in Clipsham stone, for St. Wulfran's, Grantham. Youngman can always be relied on to turn out dignified, sincere work. This figure is not exciting but neither is it dull and the combination of good design with good craftsmanship is something to be thankful for. Item 1347 is an example of the kind of thing that, unhappily, good sculptors are still asked, and forced, to do. The title is "Pocahontas: La belle Sauvage." Nothing could be less sauvage than this respectable, reclining nude gazing at a flower, with two crossed feathers in her coiffure to give the Red Indian feeling. The lady is to recline on new premises in Red Lion Square.

As usual, portraits of a consistent excellence abound. Outstanding is the portrait of Professor Thomas Bodkin by Charles Wheeler. This head with the little beard, the line of the nose off axis, one eyebrow cocked and the mouth a little open, appears to be a gift to the sculptor, but Wheeler must have been very clever to catch and fix such a fleeting expression.

Never leave the Academy without a visit to the showcase in Gallery IX where little treasures such as Audrey Blackman's two terracotta groups are to be found. "A Day by the Sea" is a nice example of her craftsmanship and sense of humour. But number 1377, figurine in unglazed stoneware, by Aileen Wyllie,

Professor Thomas Bodkin—bronze head, by Charles Wheeler, RA.

takes the prize this year. The subject is a very small chocolate coloured lady in a striped empire gown, elegant and arrogant. The judgment shown in the simple treatment of the figure and the repetition of the looped ornament on the dress, hair and earrings, is perfect.



Marcus Wickham-Boynton — portrait in bronze by Dora Gordine.

A last word on the exhibition from a display point of view. How nice it would be if next year the Academy decided to accept less sculpture and display it better! Away with the jumble of the Lecture Room!

WORK AT ST. PAUL'S

A Large Programme of Repairs and Improvements

THE current number of "A Record of the Friends of St. Paul's," 1956, No. 4, contains several interesting features, including the following report to the Dean and Chapter on the progress of work in the Cathedral by Mr. W. Godfrey Allen, FSA, FRIBA, Surveyor to the Fabric.

The repair of war damage, states the report, continues to be concentrated mainly on the work to the north transept and to the lead and timber roofs, but we have been able to finish off certain minor items including the damaged monuments throughout the Cathedral (except those in the north transept) and the stone ceiling in the Dean's Vestry.

The work in the north transept, which involves cutting out and renewing stones of considerable size and importance, cannot be hurried without risk to the stability of the fabric. This means that we cannot employ many masons and that the restoration must necessarily be slow. Even so, we could certainly do with one or two additional banker masons, and it is regrettable to report that we have recently lost two good masons because they were able to earn higher pay elsewhere. This applies equally to our plumbers, one of whom has left us for the same reason.

The work to the north-west pocket roof, which was much damaged by the bomb which fell on the north transept and which had to be largely reconstructed, has been finished.

Good progress continues to be made with the repair and whitening of the saucer-domes. The three domes in the south transept are finished and we are now at work on the domes in the nave and side aisles.

There will be a marked development this year in the work connected with the internal rearrangement of the east end of the Cathedral. Up to the present most of the work has been going on, out of sight, in the workshops of the various specialist contractors. The preparatory work on the site and the work in the shops are now sufficiently advanced for us to make a start with erecting some of the woodwork and with laying down some of the marble paving. A programme co-ordinating the work of the specialist contractors has been drawn up and will come into operation shortly. The programme for this year is as follows:

In the first quarter a start will be made with laying down the marble paving in the apse, erecting the stalls and panelling in the north and south wings of the apse and with constructing the brick and concrete base of the new high altar and altar steps.

In the second quarter the marble paving will be extended westward to the line of the temporary screen; the brick core of the high altar and of the pedestals of the columns supporting the altar canopy will be constructed and the stalls and panelling in the north and south wings of the apse will be completed except for applied ornaments.

In the third quarter the marble steps to the high altar and the casing of the pedestals of the columns will be fixed, the ironwork of the windows in the apse will be erected and a commencement will be made with erecting the American Chapel reredos.

In the last quarter of the year the American Chapel reredos will be finished (except for applied ornaments), the scaffolding required for the altar canopy will be erected and the main cedar structure of the canopy will be delivered.

A considerable advance has been made recently with the difficult problem of the stained glass for the apse windows. Mr. Brian Thomas has been chosen to design the windows and the Whitefriars Glass Works to execute them. The preliminary designs have been approved by the Dean and Chapter and the American Memorial Committee. The full size cartoons are being prepared and a sample panel of one of the windows will be offered up shortly.

During the period under review designs have been submitted for two memorial plaques to be erected in the crypt, one to Sir Alexander Fleming, the discoverer of penicillin, and the other to Viscount Camrose. Permission has been granted for a memorial to be erected to General Sir Ian Hamilton, but no designs have been submitted to date.

The Nelson Tomb is to be repaired, cleaned and regilded. The cost of this work is being defrayed by the Admiralty.

Estimates are being obtained for repainting the inscriptions on the tombs and monuments in the Cathedral, many of which have become unreadable.

Among minor works which have been dealt with I should mention the extension of the dry riser from the main roof of the stone gallery and certain repairs to the woodwork and leadwork of the west roof and one of the pocket roofs.

Pending approval of the new scheme for the setting of St. Paul's, all building projects in the immediate vicinity of the Cathedral, with the exception of the Chapter House and the Bank of England building, are at a standstill and there have been no applications for works under the provisions of the St. Paul's Cathedral Preservation Act.

The Cathedral authorities are opposing the Barbican Development Scheme which is some 400 yards to the north of the prescribed area on the grounds that the deep and extensive excavations involved would bring about a change in the subsoil and subsoil water conditions in the vicinity of the Cathedral and endanger the foundations. The Dean and Chapter's evidence has been taken.

The restoration of the Chapter House building started in April, 1955, and is now in full swing. The work will be finished this summer.

PROPOSED WORCESTER TECHNICAL COLLEGE

Minister Approves Plan

A £500,000 Worcester regional technical college, built partly on "stilts" so that the fine view of the Malvern Hills from the Severn Valley would not be blocked, was visualised by Mr. Richard H. Sheppard, FRIBA, of London, at a recent public inquiry at Worcester into a proposal by Worcester City Council to build a college at Birdport, overlooking the River Severn, near the Cathedral.

MR. SHEPPARD said that the construction of at least a part of the building on stilts would help to enhance the view to the west because the buildings would "frame the picture." From ground level people would look under the building.

MR. E. J. JONES, the City Council's Deputy Town Clerk, submitted that the proposal was justified not only on educational grounds, but from a planning standpoint. The Council had not looked round in desperation for a site for the college, but for some proper form of development of this vital area.

The scheme was strongly opposed by the Worcester Chamber of Commerce on the ground that the site ought to be used as a civic centre with adjoining gardens. A further objection was that a college sited on the periphery of the city would make it impossible for students to attend effectively, with the result that their instruction would be piecemeal and disheartening.

The Minister has now approved the plan and has stated, in the course of his decision, that it did not seem that the proposed buildings would be out of keeping with the amenities of the area.

General view from tarmac.

AIRPORT TERMINAL BUILDING
Edinburgh (Turnhouse)

Architect
ROBERT H. MATTHEW, CBE, FRIBA

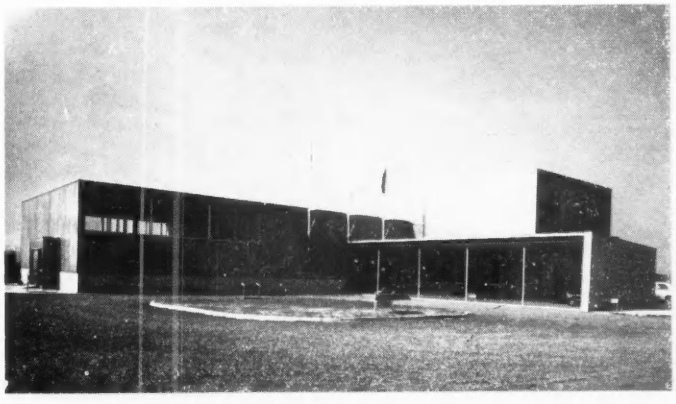
Consulting Structural Engineer
T. H. HADDOW, AMICE, AMIStructE

Consulting Heating & Electrical Engineers
IAN HUNTER & PARTNERS

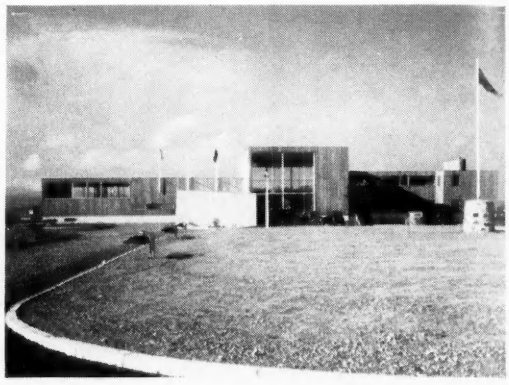
Builders
NATHANIEL GRIEVE

OPENED by the Minister of Transport and Civil Aviation, Mr. Harold Watkinson, MP, on April 12, this terminal building provides for passengers and public, airport and airline administration, and for customs, health and immigration controls. It has been planned for easy subsequent extension. The main runway is 6,000 ft. long.

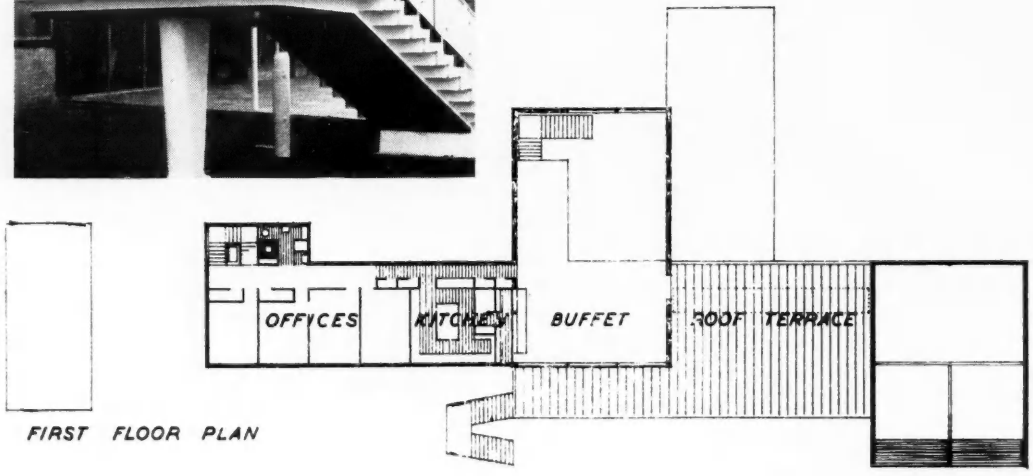
Accommodation is shown on plans, the customs hall comprising an examination area and a waiting room which can be divided by a sliding-folding partition to permit simultaneous handling of outgoing



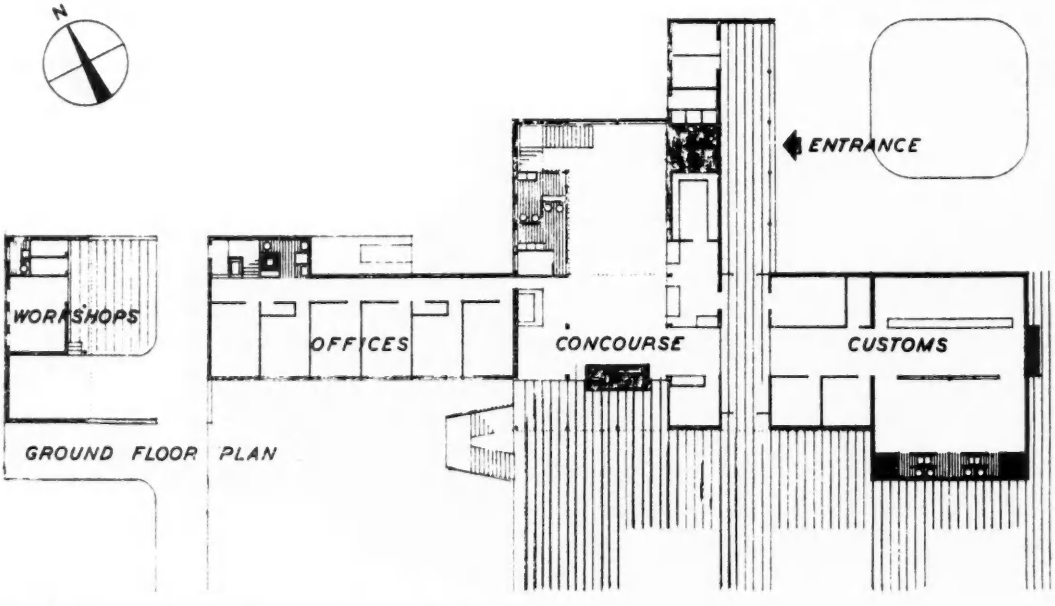
Entrance approach from east.



Above : North elevation.
Left : Stairway to terrace.

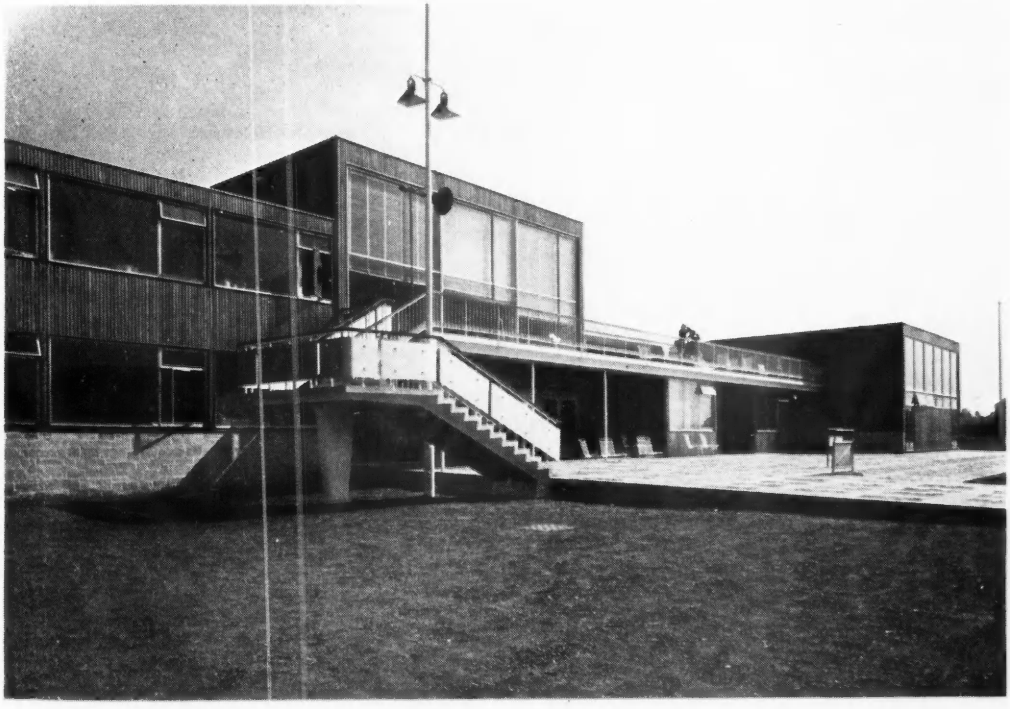


FIRST FLOOR PLAN



GROUND FLOOR PLAN

View showing buffet and stairway to roof terrace.



View from south-west.

Buffet interior, looking towards bar.

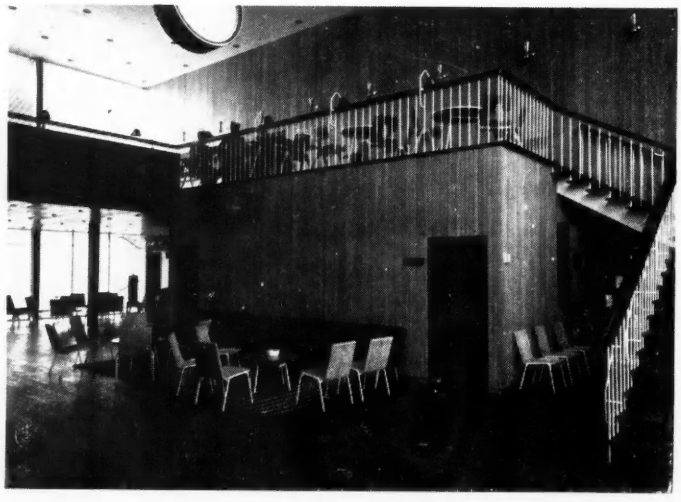
and incoming passengers. In the basement are the oil-fired boilers serving the central heating system.

Construction.—Steel framing with welded portal frames in the concourse. Steel channels carry softwood framing for wall cladding. The first floor and staircase are reinforced concrete. Steel purlins support the softwood roof framing. External walls are of Auchinlea sandstone or facing brick to ground-floor cill level, while the main wall cladding is vertical boarding of African mahogany. Walls have glass fibre insulation and inner linings of plasterboard, plywood or hardboard. Roofs are fully-supported aluminium sheet on softwood boarding and rafters. Large plate-glass windows along the 190 ft. frontage to the airfield and elsewhere are framed in mill-finished aluminium in hardwood or pressed aluminium surrounds.

Cost.—The building, together with the apron, car park and roads, was approximately £84,000.

Sub-contractors to Main Contractor: Mason, Russell and Swanston, Ltd.; glazier, Cunningham, Dickson and Walker; plumber, Patrick Knox and Son; and plasterer, Farish and Birnie.

Structural steelwork contractor: Fleming Brothers, Ltd.; *reinforced concrete contractor:* Stuart's Granolithic Co., Ltd.; *electrical contractor:* James Scott and Co., Ltd.; and *heating and ventilation contractor:* Underhill Heating Engineers, Ltd.



View in concourse, showing stairs to buffet. The concourse is lined with beech panelling and floored in wood strip, polished.

AIRPORT TERMINAL BUILDING EDINBURGH (Turnhouse)

THE PERRY & DAWES HOSPITAL, WOTTON-UNDER-EDGE

A Study in Modernisation

HUGH PERRY, by his will of 1630, left funds in trust for the foundation of an Almshouse for six poor men and six poor women, with a garden and other conveniences, on a plot of ground near the Church of Wotton-under-Edge in the County of Gloucestershire. The building, abutting on Church-street, and the chapel behind it, were completed in 1638.

In 1693 Thomas Dawes the Elder and others bequeathed money for the purchase of lands at Wotton, the revenue to be for charitable uses in that parish, and ten pounds to be paid quarterly to a school master who should teach 24 poor children of Wotton to read in the New Testament. The scholars were taught in the Chapel of Perry's Almshouse and were to attend in chapel at all such times as prayers were read. In 1712 Thomas Dawes the Younger augmented his father's gift with his messuage in Bournestream in the Parish of Wotton and all his lands there, "for use as the Trustees think best." In 1722 the Master of the Court of Chancery reported that the lands had been applied to the maintenance of a school (the Blue Coat) in Wotton and that new trustees had been appointed and a proposal made " to build Almshouses for poor persons of Wotton adjoining the hospital in the said town endowed by one Mr. Perry." The new building, known as the Dawes Building, was begun in 1723.

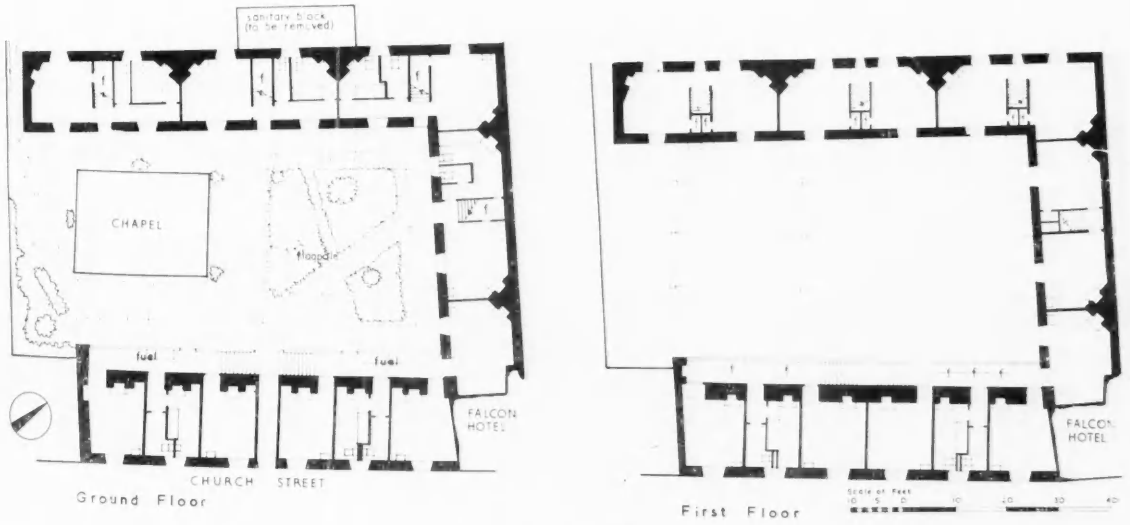
The third foundation, the General Building, appears to have been built with accumulated funds. It is clear from internal evidence that the Dawes and General buildings were erected at the same time.

1

These three foundations make up the Perry and Dawes Hospital. The buildings enclose three sides of a court, the fourth side being partly closed by Hugh Perry's Chapel. On the east side of the Dawes Building is a garden, with a house for a resident matron, overlooking the valley of the Bournestream. The buildings remained virtually unaltered for two or three hundred years. A complicated but inadequate drainage system was put in. At a later date main water taps and sinks were provided in boarded porches for the ground floors and on the stair landings for the upper floors. The connection of these sinks to existing gulleys necessitated long diagonal traverses of external waste-pipes, and serious trouble by frozen pipes was an annual experience. The number of residents was reduced from 30 to 29 by the use of a dwelling-room in the Dawes Building as a wash-house which in turn gave access to a water-closet block in a penthouse to the rear.

In 1952 the Wotton-under-Edge General Charities, the Trustees of the Foundation, obtained membership of the National Association of Almshouses. With the advice of the Association the Trustees decided to take advantage of the grant-in-aid afforded by the Ministry of Housing and Local Government to modernise the buildings, and an architect was appointed on the recommendation of the Association.

A very thorough survey was made and the architect reported to the Trustees that the buildings were in a sound condition and that, if the number of residents could be reduced from 29 to 22, full modernisation could be economically

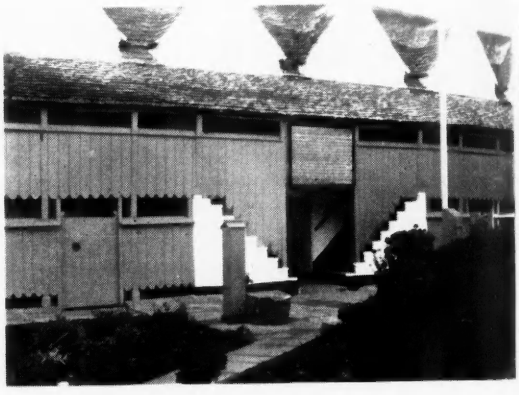


Plans as modernised.

2

The Hugh Perry Building, Church-street frontage, dated 1638, *is shown in* (**1**), *before modernisation. The windows were glazed with plain sheets of glass and only one-sixth of each pair of lights could be opened. The ground-floor windows were unprotected from the street. As restored* (**2**), *all the lights can be opened. Guard rails protect the ground-floor windows. The vents from the stack pipes are kept well back from the frontage, behind the second and fifth gables, and are virtually out of sight.* (**3**) *Shows the building from the Court, before modernisation. The ground-floor passage-way and the stairs were open to the outside, the upper gallery was closed in. Sinks were fitted in the passage way and gallery. Waste pipes gave much trouble in frost.* **4** (*after*) *shows the ground-floor passage way and the stairs partially closed in ; the upper gallery ventilated. Chimney-pots are removed. All sanitary arrangements are internal.*

3



4

The Dawes Building, 1723, *from the Court is seen in* (**5**), *before modernisation; very few windows opened, and five had been blocked. The right-hand door under the double porch gave access to the wash-house and w.c.s. After* (**6**) *every other light opens to give adequate through ventilation. The five blocked lights are opened up. The wash-house has become a sanitary unit with inside access.*

5

6

7

8

Hugh Perry's Chapel. This building (7) was heavily infected by dry-rot. It was heated by an obsolete gas radiator and the roof-vent failed to remove the fumes. Windows were glazed with plain sheets of glass. As modernised (8) dry-rot has been eradicated and the interior completely refurbished. Heating and lighting are by electricity. Windows are reglazed and permanent ventilation is provided.

carried out without structural additions or alterations and with complete preservation of the character of a building of considerable architectural and historic importance. The Trustees, with the consent of the Charity Commissioners, agreed to the proposed reduction and a scheme for modernisation was prepared accordingly. This is adequately shown by the accompanying plans.

Plumbing Work

After the necessary time for negotiations and approvals, builder's work began in July, 1954. It was completed in August of the following year. Progress of the work was necessarily slow as the almshouses were in occupation for the whole of the period. For administrative purposes the buildings were divided into six sections, lettered A to F, and work in each section was completed independently. Other accommodation was provided in the town for residents temporarily displaced.

The first work undertaken was the renewal of the drainage system and the main water supply. For the Dawes and General buildings, where sanitary units are on the ground floor only, the ordinary two-pipe system was used. In the Hugh Perry Building, where the installation of sanitary arrangements presented considerable difficulties, the single-track system was employed. It is technically interesting to note in this respect that, owing to the necessary levels of the general drainage system, it was impossible to obtain the three foot vertical drop, advised by the Building Research Station, from the lower fitting to the 6 in. inside-radius connection to the 4 in. drain. For this reason a 2 in. relief vent was taken through the duct from an anti-syphonage connection on the lower w.c. fittings to join the stack at a point above the highest connection. With this provision perfect functioning of the system is secured with only an 11 in. vertical drop from the lower fitting to the drain-head. As the sinks and baths were unavoidably at greater distances from the stack than those generally recommended, these fittings were provided with self-sealing traps, again with complete mechanical efficiency.

Modern equipment for the bed-living rooms was standardised throughout. This was: sink with main water, 1½ gall., free-outlet Sadia electric water heater; W. B. Belling table electric cooker on a gallows-bracket stand; ventilated food cupboard; space heating by "clay-lump" grates with hearth-basket; and two-way electric light switching, one at the door and one over the bed.

Food Cupboards

The external walls being in two-faced masonry with a rubble core, the ventilated food cupboards, in the Dawes and General buildings, were arranged under the internal window sills to avoid dangerous interference with the weight-bearing parts of the walls. In the Perry building food cupboards are placed in the galleries.

Sanitary equipment was similarly standardised and consisted of hospital-type low-down w.c. fittings; Goslett's "Elder" 4 ft. 6 in. baths with grab-rails; and 12-gall. Sadia electric water heaters. Space heating in the bathrooms is by 1-kW wall heaters in the fireplace recesses, protected by wire screens.

Although all equipment was standardised as to kind and heights, the positions in plan were necessarily different in every room. For this reason 1-in. scale diagrammatic equipment plans were prepared for each room, and these very considerably facilitated the work of the fitters. All piping was in copper. Virtually all window-lights were renewed; very few of the old lights opened and the lead cames had perished. The new opening lights were smith-made.

A good deal of trouble was experienced with the decoration of the internal walls which had been severely stained in the past by paraffin smoke. It was found by trial that the most effective treatment was by two coats of a proprietary obliterating liquid followed by an application of sharp white-lead. This was followed by two coats of No. 2 (soft) white Walpamur distemper. All woodwork, inside and out, was painted in a semi-gloss standard grey. External walls were treated with two coats of a lime-and-tallow preparation.

The local authority, the Dursley RDC, generously presented about 12 tons of old paving stones, and the paths in the court, some of which had been inappropriately laid in concrete, were renewed. The chapel was found to be heavily infected by dry rot. After eradication, the fittings were reinstated, the building redecorated and new electric lighting and heating put in. This work was not included in the general contract.

The cost of the contract work including all fees and expenses was, on average, just under £300 for each dwelling.

The architect was Mr. James Burford, FRIBA, the builders were Messrs. Stanley Grimes and Sons, Ltd., of Wotton-under-Edge, the smith's work being done by Mr. B. Shergold, of the Sarum Iron Works, Salisbury, with leaded lights by Mr. J. Newton Whitley, of Bristol.

CORRESPONDENCE

LCC and Ventilated Lobbies

To the Editor of *The Builder*.

SIR,—The points raised in Mr. Martin Bond's letter (your issue of May 4) are most important in conversion works, particularly in low-cost flats.

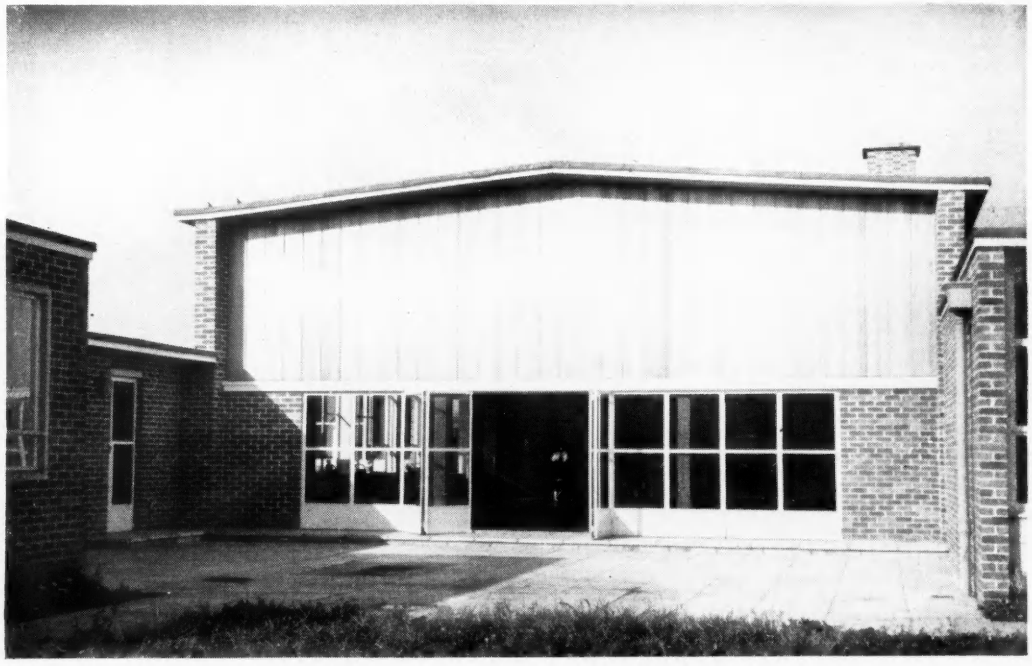
On a recent contract a combined wc and bathroom, totalling 480 cubic feet, was converted from an existing bedroom with access from the adjoining bedroom. The construction of the ventilated lobby with a small screen wall, door and ventilator, etc., cost £25, and in addition the bedroom walls and ceiling had to be redecorated as a result, at a further cost of £15.

The lobby when completed to minimum requirements did not provide sufficient room for a person to stand between the two doors, and the possibility of both doors remaining closed seems unlikely, to say the least.

Apart from this practical difficulty, the theoretical value of the lobby to encourage foul air to pass out through a small ventilator rather than through a doorway when opened, or around the door when closed, seems to be doubtful.

DAVID FRY [ARICS]

32, Fitzroy-square, W1.



The assembly hall, with cedarboard cladding. Below: General view of the school from the east.

CASTLE HILL INFANTS SCHOOL,

New Addington, Surrey

HUGH MACINTOSH & PARTNERS, Architects
in collaboration with
C. AYERST, ARIBA, Croydon Education Architect

Architect in Charge
H. HAINES, ARIBA

Quantity Surveyors
J. B. MARKS & PARTNERS

Consulting Structural Engineers
ANDREW KENT & STONE

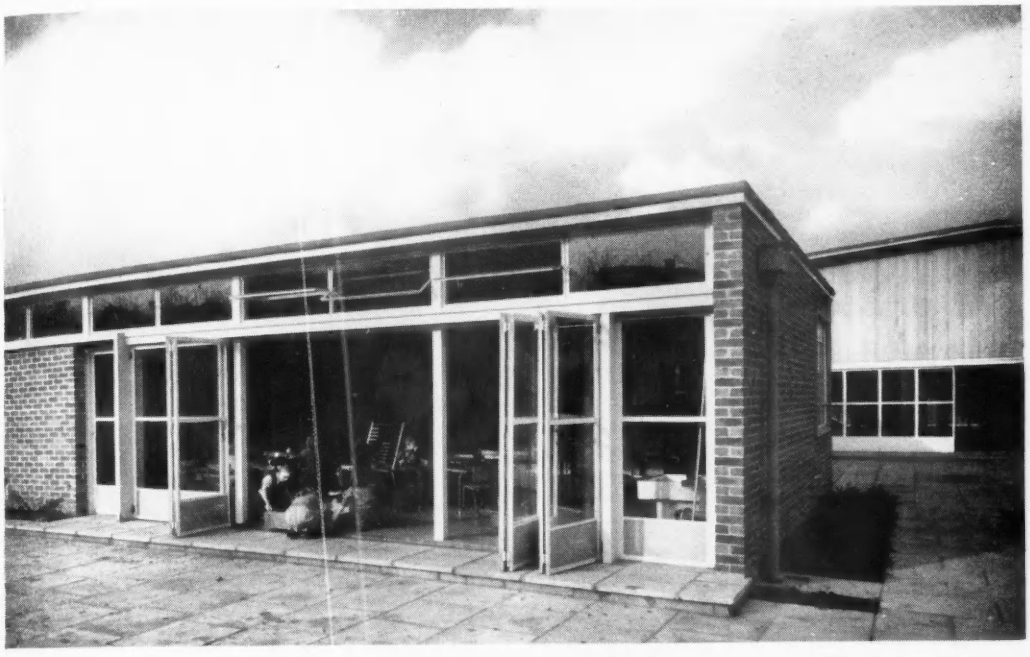
Consulting Heating Engineers
STINTON JONES & PARTNERS

Contractors
E. H. SMITH (CROYDON), LTD.

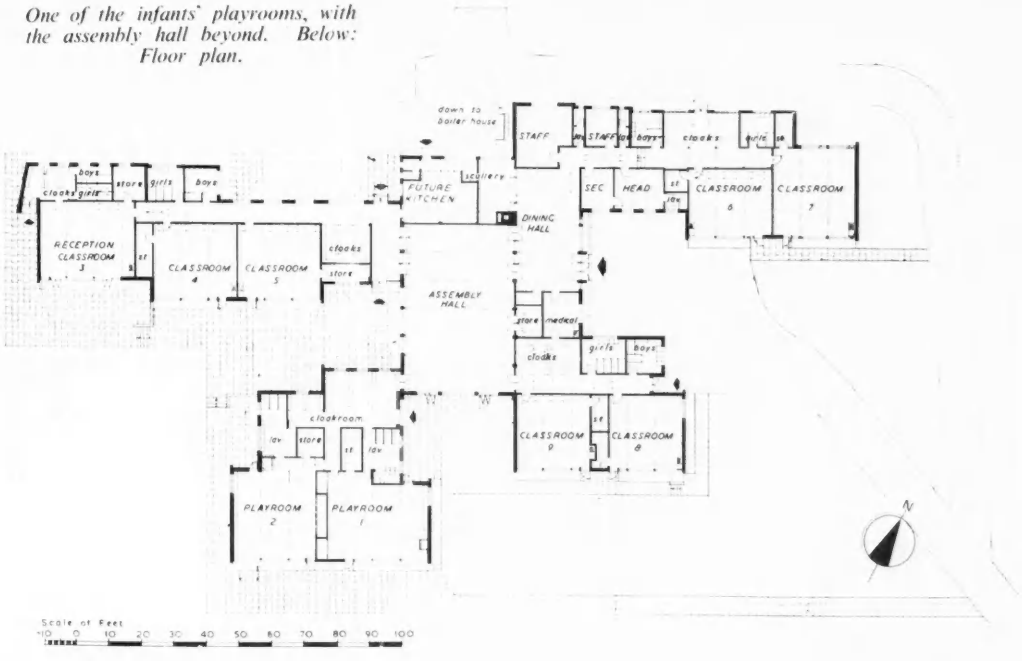
THIS is a three-form entry infants school for 350 pupils, but is also designed to be used in a few years' time as a one-form entry mixed junior and infants school with nursery classes.

As in a conventional infants school, there is no movement of children between classes. The spider form of plan was therefore adopted, which apart from its advantages in eliminating large circulation areas and long corridors, provides self-contained wings for the ultimate use of infants, juniors and nursery children. All the classrooms face south-east.

Bright colours have been used throughout, and externally the four wings have under-window faience panels in different colours (all colours having been taken from the Munsell range).



One of the infants' playrooms, with the assembly hall beyond. Below: Floor plan.



A change in level between the assembly hall and the west wing is used so that the entrance to that wing can become an informal stage to the assembly hall.

Heating is by coke-fired boilers serving radiators in the classrooms, and floor panels in the assembly hall, dining hall, playrooms and reception room. This allows these rooms to have fully-opening sliding doors to the south east, opening on to paved areas. Cork tiles have been used as floor finish for the playrooms and reception and staff rooms, and Missanda wood blocks for the assembly and dining halls. The floors of the classrooms and corridors are finished with Agba wood blocks.

Wall finishes vary throughout, and include painted plaster, painted fair-faced brickwork and unpainted facing bricks. The assembly hall ceiling is suspended

in "Sundeala" medium hardboard squares on a timber frame, with alternating colours of pink and white. The external walls are in sandfaced Wealden stocks and the outer end of the assembly hall is cladded with cedar boarding.

The building is generally steel-framed, with welded lattice girders. Box stanchions are used wherever these are exposed. The roofs comprise three-layer felt on screed and wood wool slab (which when spray-painted gives the general ceiling finish). Externally, the roof surfaces are finished with a layer of green granite chips.

The cost of the school was £45,636.

Principal sub-contractors and suppliers were:

Terrazzo WC partitions, Art Pavements and Decorations, Ltd.; tiling, Roberts and Burling, Ltd.; cork and wood block flooring, Hollis Bros., Ltd.; roofing, Permanite, Ltd.; doors, John Sadd and Sons, Ltd.; ironmongery, Alfred G. Roberts, Ltd.; structural steel, Lothian Structural Development, Ltd.; roof lights, S. Warner and Son; metal windows and doors, Crittall Manufacturing Co., Ltd.; cloakroom fittings, Cloakroom Equipment, Ltd.; blinds, London Blinds; sanitary fittings, Stitsons San Fittings, Ltd.; heating, hot water and plumbing, C. W. Evans and Sons; electrical installation, Berkeley Electrical Eng. Co., Ltd.; window gearing, Teleflex Products, Ltd.; entrance gates, Grundy Arnatt, Ltd.; paints, Jenson and Nicholson, Ltd.; facing bricks, Sussex and Dorking Brick Cos., Ltd.; faience work, Leeds Fire Clay Co., Ltd.

Above and below: Interior views of the assembly hall.

CASTLE HILL INFANTS SCHOOL, NEW ADDINGTON, SURREY

News of the Week

RICS New President

MR. W. E. A. BULL, who was elected President of the Royal Institution of Chartered Surveyors on Monday, in succession to Mr. W. R. Brackett, OBE TD, is senior partner in the firm of Messrs. Vigers and Company, in the City of London, a firm which has given no fewer than three previous Presidents to the Institution. Born in 1902, Mr. Bull was educated at Greshams School and Aldenham School. His practice is general, but covers mainly valuation, rating, town planning and compulsory purchase.

Evidence on Tribunals

THE Royal Institution of Chartered Surveyors gave oral evidence before the Committee on Administrative Tribunals and Inquiries at the Committee's meeting in London on May 24. On April 16 a Memorandum of Evidence was submitted to the Committee on behalf of the RICS by Mr. W. E. A. Bull, then senior vice-president, Major D. J. Cowan, Mr. T. J. Nardecchia and Mr. J. M. Wilkie. The memorandum has now been issued, and is available from the Institution.

British Goods in Sweden

DURING the visit of the Queen and the Duke of Edinburgh to Sweden in June, "British weeks" will be held throughout Sweden. As a centre-piece to these, the Council of Industrial Design is co-operating with the Svenska Slojdforeningen (Swedish Society of Industrial Design), to stage (from June 2 to 15) a selective display of well-designed British goods in the Kungstradgarden, a park in the centre of Stockholm. Most of the 200 items to be shown have been selected from the opening display at the Design Centre. Included among the goods which will be on view are furniture, light fittings, domestic equipment, wallpapers, tiles and building fittings.

New Advisory Council Chairman

THE LORD PRESIDENT of the Council has announced with regret that Sir Hugh Beaver has expressed a wish to resign from the chairmanship of the Advisory Council of the Department of Scientific and Industrial Research. Sir Hugh Beaver will continue to serve as a member of the Council. Sir Harry Jephcott has accepted the invitation of the Lord President to become chairman.

New Award in Technology

DETAILS of the award to be given by the recently created National Council for Technological Awards, under the chairmanship of Lord Hives, have now been announced. The National Council will grant a Diploma in Technology, the courses for which will be equivalent in standard to honours degree courses of a British university. The award will be denoted by "Dip Tech (Eng)" for engineering and by "Dip Tech" for other technologies. There will be two honours classes, first class and second class, the intention being that a student who successfully completes the course will normally reach the level of second class honours. Those who do not reach this standard may be considered for award of the diploma at the pass level. The courses which will be recognised may be either full-time or sandwich.

RIBAG's Spring Meeting

THE RIBA Golfing Society's spring meeting was held at Denham Golf Club on May 10, in excellent weather, 22 members being in attendance. In the morning the Sullivan Trophy was competed for, the winner being H. Cullerne Pratt, with a score of 82 less 9=73. The runner up was L. C. Lomas, with a score of 93 less 19=74. In the afternoon a four-ball bogey competition was played, the winners being Eric Firmin and John Grey, with the excellent score of six up. The runners up were Douglas White and J. W. McGregor—four up. Architects wishing to join the Society should contact the Honorary Secretary, Mr. S. H. Statham, ARIBA, Messrs. Sydney Clough, Son and Partners, Devonshire-close, 39, Devonshire-street, London, W1 (telephone: Langham 7101).

Gatwick Airport First Contract

THE Minister of Transport and Civil Aviation, Mr. Harold Watkinson, on the advice of Messrs. Frederick S. Snow and Partners, the Ministry's consulting engineers for Gatwick, has awarded the contract for the construction of the runway, taxi-tracks, hardstandings, drainage and ancillary civil engineering works to Sir Alfred McAlpine and Son Ltd., of Little Sutton, Wirral, Cheshire.

Captain Cook's Cottage

THE COTTAGE of Captain James Cook is to be established as a museum representing the Cook era in Australian history. The historic cottage is preserved in the Fitzroy Gardens, Melbourne, and is under the control of the Melbourne City Council. The Council has set up a panel of experts to arrange a display of original documents, maps and furnishings in the cottage. The panel will also gather material and prepare two brochures, one for students and one for tourists.

Appointment Open

THE Isle of Ely County Council invite applications by June 23 for the appointment of County Architect. Salary £1,905 rising to £2,175. Details advertised elsewhere in this issue.

COMING EVENTS

WEDNESDAY, JUNE 6

ROYAL SOCIETY OF ARTS.—"The Influence of National Character on Design," by Mr. Paul Reilly, Deputy Director, Council of Industrial Design. 6, John Adam-street, Adelphi, WC2. 2.30 p.m.

FRIDAY, JUNE 8

BRITISH BROADCASTING CORPORATION.—"Impressions of Le Corbusier's L'Unité d'Habitation," by Mr. Myles Dove, BA, ARIBA. Home Service, 4.15 to 4.30 p.m.

ROYAL INSTITUTION OF GREAT BRITAIN.—"The Relationship Between Form and Content in the Arts," by Mr. Eric Newton, MA. 21, Albemarle-street, W1. 9 p.m.

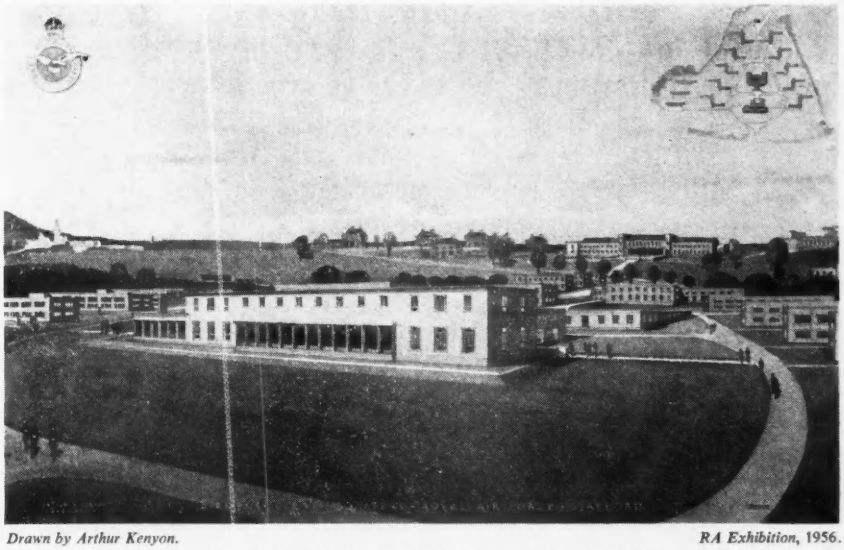
SATURDAY, JUNE 9

SOUTHERN REGIONAL COUNCIL FOR FURTHER EDUCATION.—Regional building conference, with "Changing Standards of Comfort in Building" by Messrs. H. V. Lobb, CBE, ARIBA, and C. W. Glover, MICE. Southampton Technical College.

FROM "THE BUILDER" OF 1856

Saturday, May 31, 1856

TO CLEAN WINDOWS. — Windows should be cleaned with whitening, mixed very smoothly in some water; the addition of a very little *gin to the water* is a great improvement: afterwards polish with chamois leather. In Holland small garden-engines are used in cleaning windows on the outside, an excellent plan, if used very early in the morning. J. B. N.



Drawn by Arthur Kenyon. *RA Exhibition, 1956.*

AIRMEN'S CLUB AND QUARTERS, RAF, STAFFORD.
Arthur Kenyon and Partners, Architects.

Landscape Architecture at the Flower Show

A CIVILISING INFLUENCE

THE exhibition arranged by the Institute of Landscape Architects, in the form of models, drawings and photographs of its members' work, is a welcome and notable feature of this year's Spring Chelsea Flower Show. The public ought more often to be reminded of the civilizing influences, not to speak of the professional advice, available to work on our background—particularly in the gardens so dear to the English heart — and these very English functions to which a certain snob-value attaches are the best opportunity to do so. One of our oddest propensities is to regard grey toppers and Ascot frocks as obligatory against the dated dowdiness of hydrangeas-and-half-timbering, and the décor for expensive dining in the West End is now generally falling short of the average *caffé espresso* bar.

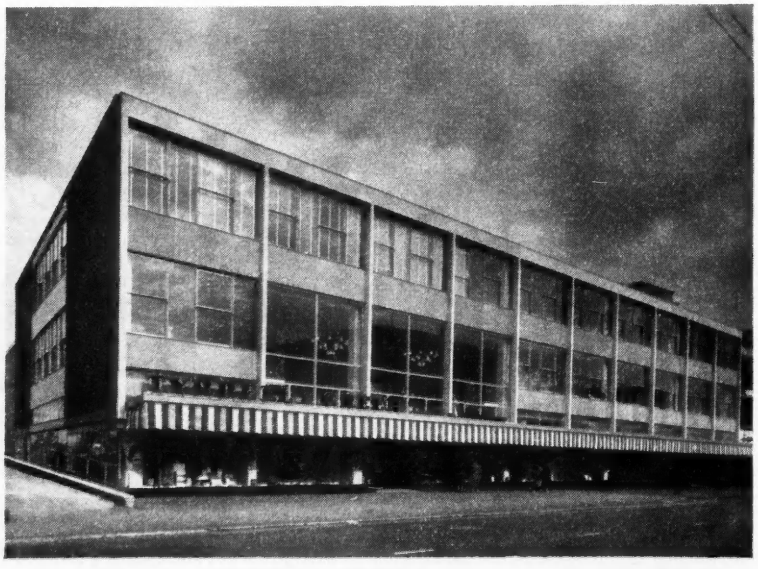
In even the lushest gardens, as amateurs we tend to leave it to Mother Nature and her green fingers, but the old dear does need planning a bit, however we may distrust the word. I suspect, however, that I am not alone in having been vague about how our latter-day Capability Browns actually go about it. I find that this is in fact by means of readily-understandable plans, though I think the landscape architect must have very trusting and patient clients, for long-term results obviously need waiting for by a generation more apt to expect them overnight from Woolworth window-boxfuls.

Indeed, I thought the technique of presentation was, if anything, a little too architectural, but perhaps this only goes to prove that orderly, two-dimensional thinking "on plan," with the third dimension taken as read, is common to all creative work of this kind. Such easily-visualised projects as Brian Hackett's garden for Rowntree's Fawdon factory and G. A. Jellicoe and Partners' model of Messrs. Harvey's roof garden at Guildford, are reassuringly free of mystery, and the latter's St. Margaret's Bay layout is equally self-explanatory.

The New Towns are represented by schemes such as the Basildon and Stevenage planting and layout. I was glad to see that the gardens of old houses are not neglected by modern experts, however, as for instance in a discreet and sympathetic job of paving with cobbled insets by William Wood and Son along a fine eighteenth-century elevation, and that the "plastic surgery" of afforestation for colliery tips, opencast mining sites and similar embarrassing national scars is also within their orbit.

Brenda Colvin, a P-PILA, shows what can be done by simple traditional means to contribute outdoor liveability to a modern architectural idiom which is only now beginning to rediscover that essential quality. Percy S. Cane, author of a recent book with the apt title, "The Earth is my Canvas," extends his at least as far as the south of France. Of the flower show itself, I will not say more than that I returned enchanted, but disheartened as usual, to my droughty suburban patch: that daylight filtered through rather grubby canvas does odd things to colour: and that the aesthetics of the vegetable section, a sort of sublimination of the pop-art of the coster's barrow, beat the more conscious floral effects hollow.

BASIL MARRIOTT.



NEW SOUTHAMPTON DEPARTMENT STORE.—A photograph of the new departmental store for Messrs. Tyrrell & Green which has recently been completed at Above Bar-street, Southampton. The architects were Messrs. Yorke, Rosenberg and Mardall. The elevations to Above Bar-street have Portland stone mullions and cornices, with Westmorland slate slabs between windows. The structure rests on 324 bores piles of an average length of 30 ft. Heating is by embedded ceiling panels, with complete air conditioning to the basement.

BUILDING ADVISORY SERVICE

NFBTE Scheme's Progress

THE Building Advisory Service has been in operation since 1954. Sponsored by the National Federation of Building Trades Employers the service is available to all building undertakings in the UK whether members of the National Federation or not.

The service charges a fee but the scale of charges is just enough to cover the cost of running the service, which is non-profit making. The service was granted aid from the American Conditional Aid Funds.

The period since its founding could be called a trial period. About fifty firms have been visited by the five members of the team.

The aim of all industries and the BAS is to increase productivity and lower costs. The general object of the service is to advise concerns, especially smaller concerns, on organisation and production techniques with a view to increasing productivity and lowering prices.

The members of the team of the service are people with an executive and technical background in the industry who have been trained in methods of work study, economics, making surveys, submitting recommendations and helping to implement them. During the trial period the team visited a cross section of the industry from firms employing 25 men to the largest contractors. Each firm gave information on their organisation and method of working, both in their offices and on the sites. The phases of the normal routine were examined and where incentive schemes were operating, the method of setting standards and calculating bonuses were studied.

As a result of the investigations the Committee of Management of the service decided that the service should:

> Give advice to building firms on such matters as planning and progressing, costing schemes, methods of comparing costs with estimates, analysis of labour costs, methods of establishing incentive bonus schemes and setting targets, and on improving clerical organisation and methods.
>
> The service should also give information and guidance to general foremen on site organisation, utilisation of available manpower, planning and progressing, implementing incentive bonus schemes and site costing.

The chairman of the Management Committee, Mr. G. W. Grosvenor, CBE, foresees a need in the future to make a more widespread impact on the industry than is possible for a small team of consultants advising individual firms on details. Eventually he hopes that there will be a demand for firms to send members of their staff for training in the use of techniques now used by the staff of the service. Firms would then be able to do even more to help themselves.

Details of the service can be obtained from the National Federation of Building Trades Employers at 82 New Cavendish-street, London W1.

CRICKET

The RIBA Win

THE RIBA Cricket XI won their first game of the season, beating the Vitruvians at the AA ground, Boreham Wood, by six wickets, after some splendid cricket.

Batting first on a green pitch, the Vitruvians were soon in trouble. Case and Francis, bowling really fast, made the ball lift uncomfortably quickly, the first four batsmen all being caught behind the wicket, two of them by Brock, a greatly improved wicket-keeper. Coming in with 21 on the board, Mudie began batting as though the rules of the game made no provision for getting the batsman out, and played both the opening bowlers, and later the left-hand Batty, with great confidence. He soon lost Dowson, but Franklyn, on loan from the Stage Cricket Club, then made the whole of the next 30 runs by some lusty hitting over the heads of the deep fieldsmen. He fell to the wily Batty, having scored 15 off the previous over, and two more wickets fell at the same score before Binfield and Mudie brought the total up to 88, when Mudie was quickly stumped hitting out. The RIBA fielding was keen. Case's four wickets for 29 in 15 overs represented a fine sustained spell of bowling.

The next hour produced some interesting cricket. The first 16 overs by Dowson and Franklyn produced only 23 runs, during which three wickets fell. Dowson gets plenty of whip off the pitch, and neither Batty nor Kennedy-Hawkes was comfortable against him or Franklyn, who also bowled with plenty of life. Hawkes went first, caught at short leg brilliantly by Chater, and two runs later Franklyn brought one back to hit Batty's middle stump. When Bishop gave a touch to the wicket-keeper, that was three down for 15. This brought Sharma and the left-handed Thomas together. Sharma should have left almost at once, giving two chances off a venomous over by Dowson which were put down. This, as it proved, was the turning point.

VITRUVIANS

D. Boswell c Batty b Case	11
K. Skelton c Brock b Francis	1
A. Boyd c Brock b Francis	7
W. Bowden c Sharma b Case	0
G. Chater b Case	9
R. Mudie st Brock b Batty	17
R. Dowson c Linfield b Case	6
W. Franklyn b Batty	30
I. M. Leslie c Sharma b Batty	0
W. A. K. Faldo c Francis b Batty	0
R. Binfield not out	4
Extras (1 bye, 1 lb, 1 nb)	3
Total	88

Bowling

Case 15-5-29-4 Batty 5-1-19-4
Francis 9-2-37-2

RIBA

J. Kennedy-Hawkes c Chater b Dowson ..	3
J. G. Batty b Franklyn	8
L. G. W. Bishop c Leslie b Dowson ..	3
S. K. Sharma not out	33
D. P. Thomas b Dowson	20
D. le M. Brock not out	9
Extras (4 b, 7 lb, 2 nb)	13
Total	89

R. Case, D. Taylor, G. R. Linfield, H. E. S. Francis and C. A. R. Norton did not bat.

Bowling

Dowson 12-3-17-3 Mudie 4-0-14-0
Franklyn 13-3-28-1 Boyd 2-0-7-0

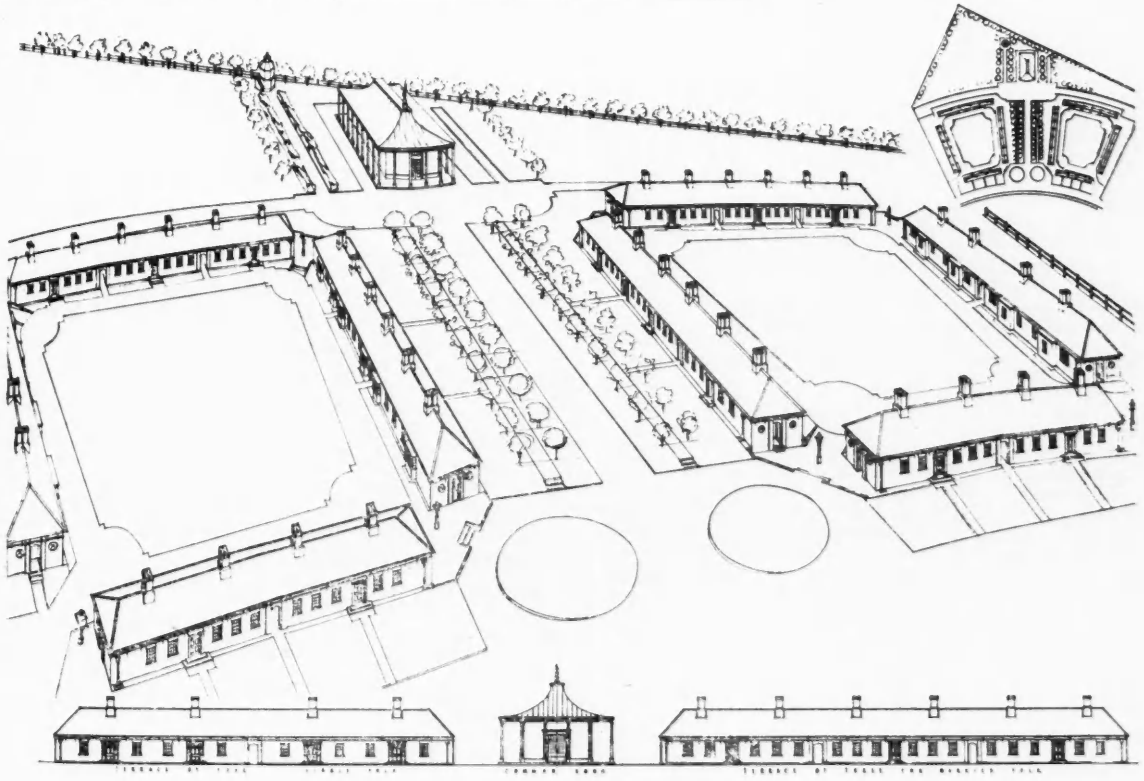
Sir Malcolm Stewart Homes, Stewartby Village, Beds

TWENTY-FOUR homes for old people were opened at Stewartby village on May 23. The homes have been erected under the provisions of a general charitable trust founded by the late Sir P. Malcolm Stewart, Bt, OBE, former chairman of London Brick Company Limited, for the occupation of old servants of the company. Tenants pay no rents or rates.

Built on either side of a wide central avenue leading to a community centre, the homes are surrounded by lawns. Setting out of the site was undertaken from a focal point in radial fashion, using the curve of the existing road.

The company's 2 in. by 9 in. rustic facing flettons are used, with flettons internally, the external walls being 11 in. cavity construction with a slate DPC. A splayed brick eaves course is introduced to avoid the need for wood soffit and fascia. Rubbed brick gauged arches to the windows are of Stamford brick, produced by Williamson and Cliffe. The door knockers have been specially designed, incorporating the number of each house. The community centre, built in the same brick as the houses, has an oil-fired central heating system.

The architect was Professor Sir Albert Richardson, KCVO, FRIBA, President of the Royal Academy, and his partner, Mr. E. A. S. Houfe, FRIBA, and the work was carried out by Robert Marriott, Ltd., of Rushden, Northants.



The Sir Malcolm Stewart Homes, Stewartby Village, Beds.

ARCHITECTURE, HUMANISM AND THE LOCAL COMMUNITY

Lecture at the RIBA

A THOUGHTFUL and suggestive paper on this subject was read by MR. HENRY MORRIS, CBE, MA(Oxon.), MA(Cantab.) [Hon. Associate] at a meeting of the RIBA held on May 15. Mr. Kenneth M. B. Cross, vice-president, was in the chair. We take the following extracts from the address.

THE age of industrialism and democracy, said the lecturer, has brought to an end most of the great cultural traditions of Europe, and not least that of architecture. In the contemporary world in which the majority are half-educated and not many even a quarter educated, and in which large fortunes and enormous power can be obtained by exploiting ignorance and appetite, there is a vast cultural breakdown which, as we approach universal literacy, will stretch from America to Europe and from Europe to the East. One effect of the breakdown to which I refer is to be seen in the disintegration of the visual environment in highly civilised countries in Europe with a long tradition of humanised landscape occupied by villages and towns of architectural character, sometimes of moving beauty.

New Forms of Architecture Inevitable

I stand before you this evening as one convinced intellectually, technically and aesthetically not only of the inevitability of new forms of modern architecture, but eager and enthusiastic to embrace this chance of a new beginning. In this case the inevitable must not merely be accepted; it must be embraced. Such realism has always been a condition of an original flowering of art forms. The conjugation of the forms of architecture that have been traditional for some three thousand years has become feeble and dies in the presence of the new possibilities of structure and material now available to us. The functional and stylistic revolution of architecture has begun and will become universal. What I would like to say as a layman is that modern architecture has made great advances in structural originality and in interior functional efficiency and aesthetic efficacy. It has not yet fully developed that external function of delight which the architecture of Europe has performed and which has to be replaced. I am thinking not only of the serving of humane values which Greek and Roman Renaissance architecture and the classically informed architecture of England has performed down to Regency times. I am thinking also of the spatial arrangements that constitute the precinct in its various geometrical forms which have given delight and security to man's daily life.

Not only has modern architecture, I suggest, not yet begun to perform what I should call its external service to the local community. One gets the impression that architects are not sufficiently aware of this service as an imperative and a necessity. Modern architects have to search and experiment to find out how far the structural possibilities of modern materials are capable of performing externally this humane, sensuous, and aesthetic function. It is difficult for a layman to see how modern architecture may throw up decorative themes which are but discarded functional devices. Time alone, I suppose, can show that. What is crystal clear is that the expression of humane values in architecture depends more than ever on the architect continuing to be an artist as well as an engineer co-operating with other artists —painters, sculptors, designers of tapestry, and craftsmen. And the creation of these conditions of delight can be quite separate from structural forms and additional to such structural forms as may be found to have aesthetic and humane value.

Our species, in solving the problem of poverty and overwork, is moving forward to a more difficult and perilous stage in its history. For what is called social progress, we have now learned, is not a movement towards a static perfection; it is the exchanging of one set of solved problems for a new and more significant set of problems making greater demands on human originality and energy. The solution of the economic problem awaits no longer so much on knowledge as on an effort of political will and administration. Universal comfort, with wealth and repletion and with large margins of free time, is the next great problem of *homo sapiens*. The human house will indeed be swept and garnished for a fresh fate. Words cannot do justice to the urgency and the wisdom of thinking out now new institutions to enable communities to face this new situation. To do this we must arm ourselves with two conceptions which are, in fact, complementary: First, adult education is the major part of education. The centre of gravity in the public system of education should reside in that part which provides for youth and maturity. Secondly, the fundamental principle and the *final* object of all future community planning everywhere, whether urban or rural, should be cultural.

Adult Education

The development everywhere and for everybody of a fully articulated system of adult education is the most important of all the tasks that lie before us. Such a development of adult education would include activities at a number of levels, intellectual, aesthetic, and recreative, with extensive provision for corporate life. The effect would be that the centre of gravity in the education of a local community would not be in the school as it is now, but in that part which provides for youth and maturity. Every local community would become an educational society.

Adult education and recreation are as necessary to everybody as food and air. So are the *active* practice and enjoyment of all the arts. I reiterate the belief I formed 34 years ago which has become stronger than ever: it is that the centre of gravity in education and the culture it transmits should be in that part that provides for youth and maturity. How is this to be brought about in the countryside and the cities? One main means to this end is to group our local communities round their colleges and secondary schools. It is plain common sense and wisdom to do this in the new housing estates, the new towns, and the expanded towns which are now being talked about. And it should be done not merely to avoid frustration, loneliness, and boredom, but with the positive intention of creating civilised communities able to live the good life. These colleges and secondary schools are an entirely new thing in our history. They cost vast sums. For instance, in a new town of 60,000 the secondary schools alone cost £1,500,000. In no other country in the world are such magnificent schools now being built. Let us, as the Minister of Education suggests, attach community wings to such villages and schools so that, with their wealth of facilities, their accommodation and equipment, they can become part of the community pattern and centres of community life.

The creation of the locality with its precinctual character is a major task of architecture, but it has been completely forgotten in the speculative building and in the housing estates of the past half-century. Even today, the precinctual locality is not provided for in the expansion of existing towns by local authorities. In the conglomeration of long meaningless streets with no social, religious or cultural significance, architecture becomes non-existent.

We can no longer achieve in the New Towns the grandeur and impressiveness of domestic architecture such as characterises for instance Bath, Regent's Park and Bloomsbury. If we are to give our new towns and the housing estates architectural significance and a civic sense we are bound to use our educational and cultural buildings as focal points. This involves the imaginative location of colleges, schools, libraries, community centres, art galleries. I am glad to say that in most of the new towns the college of adult education has been placed in the town centre so that it is given a cultural as well as an administrative and commercial character. There may be a theatre and a cinema, a hotel, cafés, restaurants and the open market. Thus the town's central square by day and night may be alive like St. Mark's Square in Venice. This blend of daily life and civic administration with the main cultural buildings is irresistible as a conception and in practice, and continues an ancient tradition of European civilisation.

Neighbourhood Centres

Likewise the neighbourhood centres, each serving a portion of the town, are spacious precincts for shopping, with an inn, a community centre or hall, the branch library with the large secondary school adjacent or near at hand. Thus, in the new towns, cultural buildings, which are the largest public buildings,

have been deliberately located to create an atmosphere of civic significance. In one new town, its nine large secondary schools have been located in groups of three, on three large sites or campuses, lying between the centre and the circumference of the town. Each campus and its buildings, gardens and playing fields is a cultural focal point, lending dignity to the surrounding streets and housing. Even infant and junior schools can be and have been sited so that they are grouped significantly with their surrounding houses.

The majority of our new educational buildings are being built in modern and not traditional terms. It is impossible to overstate the need that such educational buildings should, through their external form, composition and texture, contribute significance to their surroundings. To the extent to which a school building does not serve these humane values it is to that extent an architectural and aesthetic failure in an external world that is becoming increasingly impersonal and mechanised. I should like to observe that we may fail to create this humane function in modern architecture if we are too much influenced or dominated by considerations of speed. It is the techniques of rapid building that have done as much as anything to lead architects to sacrifice the humane external function of school buildings. In a decade or two the bad effects of an unnecessary and doctrinaire worship of speed in school buildings will become painfully obvious.

It is with such a policy, it seems to me, that town and country planning and architecture can enable a town or a group of villages to provide not only an environment, but a way of life, in which the personal, the intimate, the humane are given full expression, and where architecture as an art can make its fullest impact on young and old daily and throughout life.

RICS ANNUAL REPORT

Great Demand for Quantity Surveyors at Home and Abroad

THE annual report of the Royal Institution of Chartered Surveyors, which was presented at the annual general meeting of the Council held at 12, Great George-street, SW1, on May 28, begins with a reference to "an outstanding event of the session" in the form of the Presidential tour in Africa by Mr. W. R. Brackett, in company with Mrs. Brackett and the Secretary. The report states that the Council wish to place on record their gratitude to them "for their great services to the profession in general, and to chartered surveyors in Africa in particular, throughout this arduous tour." The report adds that notwithstanding his nine weeks' absence in Africa, the President has visited all but one of the branches in the British Isles, and the five sub-branches in Scotland. Following are extracts from the report:—

Valuation, Management and Planning.—The Town and Country Planning Committee have made a special study of the problem of dealing with vacated factories in areas of industrial dispersal, and it is hoped that they will be able to prepare a report in the near future. This committee will arrange the session to be sponsored by the Institution at the Public Works and Municipal Services Congress and Exhibition to be held at Olympia in November, 1956, when a paper on "Development Plans: Their Form and Effects" will be presented by Mr. J. F. Q. Swizter, MA, ARICS.

Building Surveying.—In addition to considering a number of matters affecting building surveyors generally, the Building Surveyors' Committee initiated during the session a study of the status of building surveyors employed in local government service, and a report by a special sub-committee on the subject is receiving the attention of the committee. The position of those members who are registered architects and who are also in practice as auctioneers and estate agents was considered in the light of the ruling of the Architects' Registration Council published during the session, and a note on this subject appeared in *The Chartered Surveyor for January*, 1956.

Employment in the Profession.—Over 1,000 persons were interviewed by the Appointments Officer during the year. Correspondence with members and the public at home increased considerably and it is encouraging to note that the many and varied services of the Appointments Register are becoming better known.

Apart from agriculture and land agency, there was a constant flow of vacancies and applicants for appointments at home and overseas. The following table summarises the position:—

Section	*(a) Vacancies filled by Members, Probationers and Students*	*(b) Pupils and Trainees Placed*	*(c) Partnerships Arranged*
Agriculture and Land Agency	16	3	—
Valuation, Housing Management and Town and Country Planning ...	73	9	6
Building Surveying	68	14	—
Quantity Surveying	42	40	2
Land Surveying	6	2	—
Totals ...	205	68	8

There has been a steady demand amongst private firms for senior and junior building surveyors. The position of the building surveyor in the profession and in the public eye has improved and salaries are now more in tune with general levels. There has also been a demand for building surveyors from property companies and industrial concerns.

There has been a great demand at home and abroad for quantity surveyors of all grades. Fewer quantity surveyors are changing their jobs and it has been impossible to fill many of the vacancies for senior and junior "takers-off." Openings with the public service have not been as numerous as in previous years, and the general tendency has been for members seeking employment to prefer private practice.

Opportunities in Africa

Many inquiries about employment conditions abroad (especially in East and Central Africa) were received from members qualified or qualifying in all branches of the profession. Contact has been maintained with the Colonial Office and liaison established with some of the Commonwealth and Colonial government offices in London.

There has been a steady demand by private firms for articled pupils and trainees. Contact with the Public Schools Appointments Bureau in London has been strengthened, as well as liaison with youth employment offices in various parts of the country. The majority of firms engage boys as pupils or trainees at a small weekly salary with no premium.

There has been a considerable increase in the number of written and telephone requests for chartered surveyors to undertake professional work. The majority of inquiries are for members who are competent to undertake structural surveys of house properties. Demands for specialists have also increased.

Quantity Surveyors' Committee

Cost Research Panel.—The Committee appointed a Steering Committee on the subject of cost investigation. The report of the Steering Committee was approved and was submitted to the Council.

On the Committee's recommendations the Council have decided in principle to encourage participation in the field of cost investigation on the following lines:—

(i) that a Research Panel be formed of a small number of Institution members consisting of, say, three quantity surveyors and one building surveyor, with representatives of the Building Research Station and such other organisations as it may be considered desirable to co-opt;

(ii) that the terms of reference of the Research Panel should be: (*a*) to keep under review the sources of cost information available to the building industry; (*b*) to examine cost relationships for design alternatives and to draw conclusions therefrom; and (*c*) to consider the factors which cause the cost of similar items of building work to vary, including the effect of standardisation and repetition in design;

(iii) that the Research Panel should consider the possibility of the creation of a focal point to collect information; and

(iv) that the Research Panel should be given suitable financial backing by the Institution in order that honoraria or other grants might be made available, subject to the approval of the Council, to those providing or carrying out research or investigation into building costs.

Joint Consultative Committees of Architects, Quantity Surveyors and Builders.—The representatives of the Institution continue to play their full part in the deliberations of the Joint Consultative Committees at national, regional and local levels. The past session has seen the establishment of the last of the ten regional Joint Committees.

OBITUARY

B. C. Hammond, CBE

THE DEATH has occurred of Mr. B. C. Hammond, who retired last year after 44 years' service with Worcestershire County Council, the last 29 as County Surveyor and Bridgemaster. He was President of the County Surveyors' Society in 1946-1947 and was awarded the CBE in 1949.

S. A. Bettesworth, FRICS, LRIBA

WE REGRET to record the death on May 21 of Mr. Sidney Albert Bettesworth, FRICS, LRIBA, at Northwood, Middlesex.

Honoured by Sweden

Mr. W. A. de Vigier, chairman of Acrow (Engineers), Ltd., has been made a Knight of the (Swedish) Royal Order of the North Star.

SOCIETIES

ARCHITECTURAL ASSOCIATION

Election of Council for 1956-57

IT was announced on Wednesday (May 30) that the Council of the Architectural Association for the session June 1, 1956, to May 31, 1957, will be as follows:—

President: Mr. Gontran Goulden, TD, ARIBA. *Vice-Presidents,* Messrs. John Brandon-Jones, ARIBA, AADipl, and D. Clarke Hall, FRIBA, AADipl. *Hon. Secretary:* Mr. H. T. Cadbury-Brown, FRIBA, AADipl(Hons). *Hon. Treasurer:* Mr. Edward Playne, DSC, FRIBA. *Hon. Editor:* Mr. J. M. Austin-Smith, MC, TD, ARIBA, AADipl. *Hon. Librarian:* Mr. Oliver J. Cox, ARIBA, AADipl(Hons).

Ordinary Members of the Council: Messrs. Neville Conder, ARIBA, MSIA, AADipl(Hons); Anthony W. Cox, ARIBA, AADipl(Hons); L. De Syllas, ARIBA, AADipl(Hons); J. Eastwick-Field, BA(Arch) (Lond), ARIBA; G. Epstein, AADipl(Hons); W. G. Howell, DFC, MA(Cantab), ARIBA, AADipl(Hons); John Lacey, FRIBA, AMTPI, AADipl; Edward Mills, FRIBA; Peter Newnham, MC, ARIBA, AADipl (Hons); Michael Ventris, OBE, DrPhil, FSA, ARIBA, AADipl(Hons); Bryan Westwood, FRIBA, AADipl(Hons) (Past-President).

WEST YORKSHIRE SOCIETY OF ARCHITECTS

Scholarship Awards and Election of Officers

THE West Yorkshire Society of Architects has made the following awards:—Bedford Scholarship (value £75), Mr. M. L. Kirk, Hunsworth, Huddersfield; second prize (£25), Mr. D. M. Spouse, Newton Hill, Wakefield; Girling Prize (value £60), Mr. F. S. Bedford, Pontefract; Plows Prize (value £50), Mr. D. Jowett, Halifax.

Mr. Geoffrey Taylor, Ashenhurst, Huddersfield, has been selected to visit Rome under arrangements with the Royal Institute

ASSEMBLY HALL, ENGINEERING COLLEGE, RANGOON

Construction of the Teak Dome

THE accompanying photographs show the progress being made in the construction of the laminated teak dome for the Assembly Hall of the Engineering College, Rangoon University, for which Messrs. Raglan Squire and Partners, 3 Hobart-place, SW1, are the architects.

The geometry of the roof on a transverse section consisted of a series of arcs of constant radius, but with centres descending along the line of a predetermined longitudinal arc. This conception of the geometry of the curves simplified the setting-out of the formwork ribs, as these could be fabricated from a jig, the only variation being a difference in length of each rib.

The temporary formwork of ribs at 2ft. centres was erected on a framework of scaffolding, the top of each vertical scaffold tube being provided with a U-shaped adjustable bracket into which the formwork ribs were secured by bolts (Fig. 1).

To the upper edge of each rib was fixed a series of perforated steel rocker-plates on which the first layer of teak ($\frac{7}{8}$in. boards running longitudinally and tongued and grooved together) could be laid and secured. Lamination was commenced from the centre, each board being placed in position and temporarily screwed to the rocker-plates from beneath (Fig. 1).

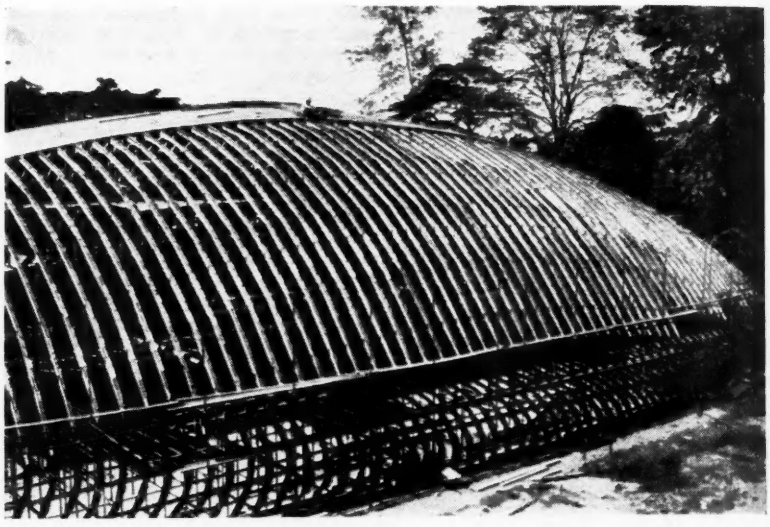


Fig. 1.

Before the completion of the base lamination, two curved laminated timber edge-beams were formed (Fig. 2). These beams were built up in position from shaped boards, each board having been cut to the correct profile on the ground before *in-situ* assembly was commenced.

After the completion of the edge-beams and the first layer, the four subsequent layers of $\frac{7}{8}$in. square edged boards (second diagonal, third transverse, fourth diagonal, and fifth longitudinal) were glued and screwed in position.

The final operation will be the shaping of the end eaves line and the piercing of the five layers of boards to receive roof lights. Fig. 3 shows the shell after completion of the first layer from the balcony of the adjacent Mechanical Engineering Block.

Fig. 2.

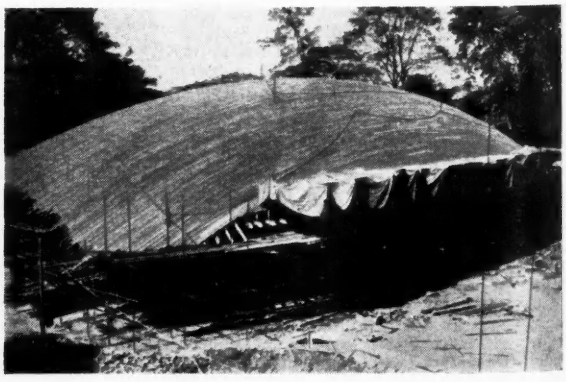


Fig. 3.

of British Architects, the Society paying £50 towards the cost.

The following officers have been elected: President, Mr. Norman H. Fowler, FRIBA; vice-presidents, Mr. R. H. Winder, FRIBA, Mr. J. G. Berry, FRIBA; honorary secretaries, Mr. R. S. Shapley, FRIBA, Mr. D. M. Jones, ARIBA; honorary treasurer, Mr. R. Thompson, ARIBA.

ESSEX, CAMBS AND HERTS SOCIETY

Visit to Belgium

A PLANE carrying its full complement of 36 passengers left Southend Airport on May 12 bound for Ostend. On board were members of the Essex, Cambridge and Herts Society of Architects who, with their wives, were travelling to meet their counterpart on the other side of the Channel. The party was met by the Town Clerk of Ostend, his Deputy and a deputation of Belgian architects who freely offered their services. Among the many buildings visited, the new Kursaal with its magnficent Concert Hall and Restaurant proved of great interest. The party visited Bruges on the following day and returned by air on Sunday evening, May 13.

TRINIDAD AND TOBAGO SOCIETY

Architects' Exhibition

THE Trinidad and Tobago Society of Architects held their Architects' 1956 Exhibition at the British Council premises in Pembroke-street, Port of Spain, in the first week in May. The exhibition, which was the second the Society has held, was opened by the Minister of Works, Mr. Ajodhasingh, who assured the architects of Government's interest in good design, and told them to be prepared for a busy time ahead to keep pace with the political developments of the Colony. The next day HE the Governor, Sir Edward Beetham, visited the exhibition and had tea with the Society's chairman, Mr. A. Lewis, FRIBA, and the exhibition committee. In all over 2,000 people visited the exhibition, and saw some 120 photographs and drawings covering the past year's work by the local architects, together with a central stand explaining in sketch form, with captions, the work covered by the profession. Architects exhibiting included Mrs. S. Lewis, Colin Laird, ARIBA, A. Lewis, FRIBA, Mence and Moore, A/LRIBA, Prior, Laurenco and Nothnagel, FRIBA, Watkins and Partners, FF.RIBA, and the Architectural Branch, Dept. of Works and Hydraulics.

NFBTE

American House-builders Visit

A PARTY of 20 American house-builders—members of the American National Association of Home Builders—arrived in London on May 24 on the first leg of a six weeks' study tour of Europe. During their stay in England the party will visit housing sites in London, Bristol, Coventry and Leicester. On May 28 they will be the guests of Mr. Nigel Hannen, president of the NFBTE, and Mr. Frank Russon, president of the Federation of Registered House-Builders, at a dinner to be held in London.

During the course of their tour the Americans will study housebuilding methods in Sweden, Denmark, Germany, Switzerland, Austria, Holland, Belgium, France and Italy.

TOWN PLANNING DECISIONS

Minister Refuses Extension of Temporary Business User Consent in Mayfair

THE question of extensions to temporary business user consents granted in respect of premises zoned for residential purposes in the County of London Development Plan arose from a recent application by Messrs. Edwin White and Co. to the Minister of Housing and Local Government for permission to continue the use of the ground, first and second floors of No. 78 South Audley-street, Westminster, for office purposes until December 31, 1971.

The applicants contended that the premises were too large for use as a single-family residence and that the layout of the building did not allow for economic conversion into flats. The London County Council supported the contention and for that reason they granted permission in 1949 for the use of the premises as offices for a limited period which expired in April, 1955. They were willing to extend that permission until December 31, 1971, having regard to similar temporary permissions which they had granted in respect of neighbouring premises.

In giving his decision the Minister points out, however, that this area is allocated for residential use in the administrative County of London Development Plan, which was approved by him recently, and that the plan provides that in residential zones throughout the County where temporary permissions have been given for a change from residential use to some other use the premises will revert to residential use on the expiry of the present term of the permission, and except in very special circumstances, no further permissions or extensions of existing permissions for other such uses will be given.

The Minister has, therefore, given careful consideration to the facts of the case and the representations made with a view to seeing whether there are any very special circumstances such as would justify any departure from the development plan. He is not convinced that the ground, first and second floors of this house could not be restored to residential use, but is prepared to grant a short extension to the temporary permission solely in order to allow the present occupants reasonable time to seek alternative accommodation in an appropriate zone.

Accordingly, the Minister hereby grants permission for the continued use of the ground, first and second floors of the premises for any purpose within Class II of the Schedule to the Town and Country Planning Use Classes Order, 1950, subject to the condition that the said use shall cease on December 31, 1956.

St. Helens Housing

St. Helens Corporation, Lancashire, are proposing to build an estate of about 750 houses at Eccleston, which lies just outside the borough. The rural residents are opposing the scheme. Like many other large towns St. Helens has a big housing programme coupled with the difficulty of shortage of building land.

FIRE RESEARCH TO BE EXPANDED

Plans for New Buildings and Larger Staff

IN "Fire Research, 1955,"* published on May 23, the Fire Research Board states that a new agreement between the DSIR and the Fire Offices' Committee will mean expansion for the Fire Research Station and its programme of work. Annual expenditure will be increased from just under £90,000 to a maximum of £125,000. Staff will go up from less than 80 to something over 100. New buildings are to be provided, among them one in which fires in large-scale models will be studied under controlled conditions. The expansion will be gradual.

In a review of the work of the organisation, the Board says that the present situation is "not unhealthy." It points out, however, that the amount of advisory work must be kept within bounds. Background work is essential to maintain the scientific health of the organisation. This background work falls under three main headings; the study of combustion and its suppression, the behaviour of various materials when subjected to high temperatures, and the study of factors conditioning the development of fires in buildings.

Under the first heading some basic work is being done on the propagation of flame in containers of complicated shape and along ducts and on the conditions that precede and lead to detonation. The main attention is being paid, in work under the second heading, to the behaviour of concrete at high temperatures. A difficult study which comes under the third is the manner in which the development of fire is influenced by the design and contents of buildings. Practical experience is not always adequate to deal with new forms of material and construction that are becoming available. Neither is it enough to solve problems of the means of escape from buildings and the use of protective installations. A reliable technique of using models would be extremely valuable here and fundamental work into heat transfer and the movement of hot gases is aimed at finding out if this can be achieved. The research should provide information which will be useful in connection with many of the problems of the Factory Department of the Ministry of Labour and National Service.

Causes of Fires

During the year the Board set up a Committee to advise on research on industrial fires and explosions. Preliminary surveys have already been made of earlier work in this field and, besides showing where research is likely to be profitable, they contain information of immediate interest to industry. Publication is being arranged.

To keep in touch with current trends in outbreaks of fire the organisation receives reports on all occurrences attended by the Fire Brigades. These give much incidental information of interest. For example, the number of fires associated with the use of electricity is increasing steadily. If the increase goes on there will be three times as many in 1975 as there are now. The number of these fires is directly proportional to the energy transmitted and is approximately one fire per 10m. units. As the consumption of electricity increases, the strain on Fire

Brigades will grow heavier. One of the greatest dangers is amateur wiring of additions to existing installations.

Chimney fires which were not confined to the chimney but set light to other parts of the house increased during 1955. The number of these has gone up every year since 1950. In that year the number was 668. It is now 3,168. One cause of fires remaining fairly steady is malicious ignition. During the year 228 fires were started deliberately in buildings and 90 in the open.

Large fires are mostly discovered between midnight and 4 a.m. or at about 6 p.m. The majority appear to be well developed when discovered, and textiles and timber are two materials most frequently on fire. Sprinkler systems have continued to prove extremely successful in preventing the development of potentially large fires. The damage caused by some of these fires could have been reduced if the systems had been allowed to work properly. Many of them were shut down, in a state of disrepair or limited in action because of badly stacked goods.

Sawdust and Woodwaste. — Spontaneous ignition of heaps of sawdust and woodwaste is still a most troublesome problem. It can occur in green sawdust and woodwaste in heaps of tens of thousands of cubic feet or more. Ignition happens mainly where large quantities of woodwaste are heaped for use as fuel. The organisation suggests that heaps should be piled up by stages and the behaviour at each stage carefully observed.

Roof Test.—A draft specification of a fire resistance test for roofs has been prepared for submission to the British Standards Institution. The test measures the time taken for the underside of a roof to catch fire when radiation similar to that from a nearby burning building falls on the outside. Spread of flame on the outer surface is also measured. The proposed method of classifying roofs is based on their performance in both tests. A number of roof constructions have been tested and the report contains the results.

Sparks from Grates.—Under the heading "Special Fire Hazards" the organisation reports work that has been going on into fires caused by sparks from grates. Every year between 500 and 1,000 of such fires occur. The investigation aims at finding out the requirements for spark guards. Other work is concerned with the flammability of fabrics, burns on human skin and the generation of static electricity from ordinary clothing materials and new ones, such as "Terylene," nylon and polyvinyl chloride sheet. The latter point is important because of the hazardous atmospheres that can exist while aircraft are being refuelled, oil tanks refilled and so on.

Fire Detector.—A detector has been developed which will reveal the location of a fire through dense smoke. The detector is sensitive to infra-red radiation. A parabolic mirror focuses the radiation on a photoconductive cell which is capable of detecting radiation from flames or surfaces hotter than 150 deg. C. A resistance is used to change the frequency of a tone in a pair of earphones when the detector is pointed at a flame. The instrument can detect a candle flame at a range of about 60 ft. and should be a useful, portable tool for firemen's use.

"Fire Research, 1955" is published by HMSO for DSIR, price 4s. (72 cents USA), by post 4s. 3½d.

AUTOMATION AND THE INDUSTRY

Implications for the Architect, Builder and Operative

By a Labour Correspondent

THE word "automation" has begun to appear more and more frequently in newspapers, radio and television. At first glance this industrial sobriquet would appear to have little to do with building, but neither, say 50 years ago, would the invention of the internal combustion engine have seemed to be particularly relevant. Yet now the internal combustion engine, in one application or another, is indispensable to the average site.

Reduce the period of 50 years to 15 or 20 to allow for the accelerated pace of all industrial development and there can be small doubt that many of the products and effects of automation will have wrought considerable change to building by that time.

Some publicists have begun to play down automation as being nothing intrinsically new, and are arguing that it is merely a natural further stage of development in the machine age. There is some truth in this, but there is no point in denying that the change over by any factory to complete automation is a sharp leap forward as distinct from the gradual introduction of better and more efficient conventional machinery.

Mr. V. Nielson, of the Danish Woodworkers' Union, has succinctly expressed this distinction thus: "But then what is automation? In short automation is the control of machines by other machines. Automation differs from mechanisation. Mechanisation is the use of machines to do physical work. Automation is the use of machines to control those machines which do physical work. Mechanisation replaces men's muscles; automation replaces men's five senses."

Mr. Nielson is obviously correct and this accounts for the fears which have been expressed by many trades union leaders both in this country and abroad. Will automation in fact make redundant men who have spent many years of apprenticeship and study to acquire skills and callings, thus repeating the "massacre" of the old hand-loom weavers of 150 years ago? Is the economic security vouchsafed by specialised knowledge and dexterity to be wrenched from wage-earners whose whole lives have been dedicated to their trade or craft?

Basic Issues

The recent strike at the Standard Motor Works was unquestionably on these basic issues. The men involved were the élite among wage-earners, car and house owners and addicts of lower middle-class respectability; there were no impassioned appeals to the class struggle at the strike meetings but the whole atmosphere was one of stark fear that the structure of their lives was at stake; that they and their families might be torn from the social fabric of television sets, smart clothes, and scholarships for Peter and Patricia. One responsible commentator was astonishingly ignorant of all this when he ingenuously suggested that there was a shortage of bus drivers: obviously he had got his rungs of the ladder mixed.

As is to be expected, automation is being introduced on a large scale in the USA in the first instance. There the reactions of the trades unions can be summed up as one of apprehensive excitement. Mr. George Meany, president of the AFL-CIO, envisages completely automatic factories "run by electronically set devices without the intervention of human hand." He thinks that this will not occur on a large scale until 1980 but adds rather pregnantly that "Our concern is less with 1980 than the road to it."

Vice-president Walter Reuther, who is perhaps a living synthesis of American mass production thinking, talks of a reduction in working hours to 32 per week, and a resolution of his own Automobile Workers' Union—probably of his drafting—says that "If automation is applied in a careful and fair manner, it may mean the coming true of man's age-old dream of economic abundance."

US Woodworkers' Views

Nearer to our own industry there comes a statement from the American Woodworkers: "We are not opposed to automation but we want legislative and contract guarantees to make sure that it is not recklessly and irresponsibly applied." This last is no doubt provoked by the fact that advanced mechanisation has already been achieved in American woodworking factories, and at one sawmilling undertaking in New Mexico automation is actually in operation. This mill cuts 50,000 bd. ft. per shift of 4 in. by 4 in. timber direct from logs; each shift consists of six men.

Information on what is happening in the Soviet Union on automation is slender, but one report speaks of experiments in hydraulics as the motive power of "the machines to control the machines," this being thought more reliable and less complex than electronic relays.

On any showing it is evident that the industrialised countries of the world are on the eve of a spectacular advance in the field of mass production of standardised commodities, and Britain can only resign from the race at the expense of eclipse in the world's markets.

We can expect then that throughout machine manufacture the next decade will witness the progressive adoption of automation, and as far as building is concerned this will hasten the development of prefabricated components. And, unless the RIBA successfully discourages dimensional co-ordination—an unlikely event despite the aesthetic troglodites—we are likely to become less actual fashioners of materials and more component assemblers.

How will this affect the existing organisational structure? As far as the unions are concerned the effect will be considerable if only because the emergence of new specialist skills is inevitable. The Amalgamated Society of Woodworkers, the largest union in affiliation

with the NFBTO, is perhaps the most traditional of British trade unions. Its members are exceedingly craft-conscious and moreover most foremen and general foremen stem from its ranks. Yet, precisely because its operational field has been the first to receive the impact of mechanisation and pre-fabrication it has been forced to recognise specialisation.

There are an increasing number of ASW members who do not work in wood at all; these are the men who handle plastics, non-ferrous metals, and the growing range of synthetic woods. Their appearance among the white aproned aristocrats has not been without some injured pride, but fortunately the union is led by a relatively young executive committee who are crystal clear on the policy to be followed. This is one of complete non-resistance to any new kinds of work which supplant timber and the encouragement of existing members to undertake such employment. Where there are no carpenters and joiners available, and by some mysterious means, non-unionist specialists arrive on a job, membership in the ASW is offered to them—a privilege which most appreciate.

However, apart from the understandable desire of the generals to maintain their battalions at full strength, there is of course the purpose of defending the standard Working Rule Agreement and to permit no deviations from its provisions, for without the comradeship of common tools and skill the only cement left is a standard contract of service.

These, then, are some of the waves caused by the pebble of technical development, and we can have small reason to doubt that the other craft unions will respond in a similar manner as the widening rings reach them. Indeed, this has already happened with the bricklayers and plumbers; *vide* precision concrete slabbing and plastic pipes. The only danger would seem to be one of jurisdiction. This question was examined in a previous article on demarcation and a footnote can be added here that the NFBTO has since been asked by its affiliates to produce a formula for their consideration—evidence of a desire to come to grips with the problem.

Thus it would appear that the existing trades unions in building in spite of their longevity and heroic traditions, are willing to face and accept greater specialisation and variety of skill and become, in effect, unions of specialists. They are fortunate in having a little more time at their disposal for adjusting the minds of their members than the engineers.

The Operative's Attitude

Turning from the question of development off site and the changes in techniques initiated by materials manufacturers, the attitude of the operative towards site mechanisation and powered hand tools has never been hostile; in fact, there is a tendency to welcome methods which can remove the drudgery from many operations. As far as labourers are concerned this has entailed tremendous change in the past 30 years. The knee-strapped navvy has all but disappeared and in his place we have machine drivers who are often highly skilled.

Unfortunately, high levels of mechanisation are as yet confined to the larger contractors for the obvious reason that medium and smaller firms do not possess the necessary capital. But even in the matter of low-priced small machines there appears some resistance to their purchase out of sheer conservatism. This has not escaped the attention of the operatives, and in union journals a new kind of criticism is now being voiced. In the form of articles and letters there is an ascending note of disapproval, not against private enterprise but against private unenterprise.

Whether all this refreshing flexibility would continue under conditions of increasing unemployment is another question, but whilst there are jobs for all there is no reason to suppose that the progressive policies of the unions will suffer restraint. Nevertheless, passivity is hardly sufficient and one would like to see more active participation by the operatives in the developments discussed in this article. For this they would need the encouragement of the employers. Would not a standing national joint committee on new techniques be more useful than Disputes Commissions on demarcation?

AUBTW

President's Hint of Struggles to Come

IN his presidential address at the 29th national delegate conference of the Amalgamated Union of Building Trade Workers, which is being held at Leicester this week (May 28 to June 1), MR. HARRY WEAVER referred to the acceptance by members of the "new principle" of union contributions fluctuating with the rise and fall of wages, and went on to call for a recruiting drive to bring membership up to at least the 100,000 mark. In the past year, he said, membership had declined by over 370, and it now stood at about 96,000.

"The facts are, of course," he continued, "that the building unions have a tremendous task in maintaining and improving living standards and working conditions in what is acknowledged to be one of the most backward industries in the industrial life of this country. We all know that the very nature of the building industry throws up a type of employer slow to respond to modern techniques and as a consequence reluctant to introduce improvements in the field of human industrial relationships.

"We cannot view with complacency the high percentage of non-unionists in our industry—particularly in the so-called unskilled section. Whilst this situation exists, we shall continue to be hampered in our efforts to advance the living standards and working conditions of our members. It should never be forgotten that the unions affiliated to the NFBTO have to accept the responsibility for negotiating wages and working conditions for a million and a quarter men. Less than half that number accept responsibility for maintaining the unions. This question of recruitment is likely to prove decisive in the undoubted strugggles that lie ahead."

Mr. Weaver went on to refer to the ultimate goal of their movement as "complete social ownership of the means of production," but in order to avoid the complete breakdown of the present mixed economy "we in the trade union movement play our part in encouraging the introduction of improved industrial techniques, new materials and machines for the purpose of improving output and reducing prices."

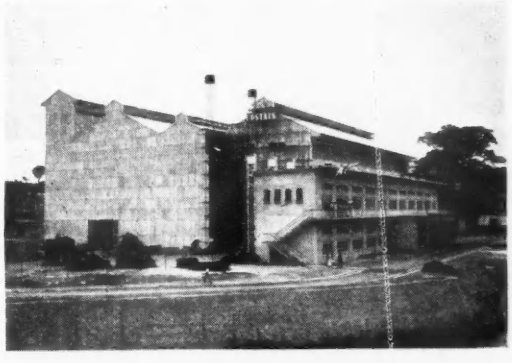
Making a plea for the control of incentives, the President said that thousands of pounds had been spent sending production teams abroad to study how other people tackled these problems. For the past nine years incentive schemes had been permitted in the building industry, yet to-day there were not more than around 20 per cent. of workers in the industry being given the opportunity to relate earnings to output.

"In the last two or three years we have been trying to persuade the building employers to approach this matter in a scientific way and to reach a national understanding that will bring the whole of incentive bonuses under some sort of control and discipline," he said.

"So far we have been unsuccessful, but we are promised that the employers may have some proposals to put before us within the next few months. Nine years, however, is a long time and the general public are entitled to know that it is the same employers who demanded the introduction of incentive schemes who have failed miserably in putting their theories into practice on a national scale.

"The confusion and chaos that has resulted from the employers' failure in this matter has undoubtedly proved expensive to the economy of this country."

NIGERIAN POWER STATION



The Oji River power station near Enugu which was visited by the Queen and the Duke of Edinburgh during their tour of Nigeria this year. 200 tons of asbestos cement cladding has been used for the project in the form of Watford tiles, "Twin Twelve" sheeting and troughing units, the suppliers being Universal Asbestos (Overseas) Ltd., of Watford. The consulting engineers are Messrs. Coode and Partners and the main contractors Richard Costain Ltd.

The Builder Review of PLANT & MATERIALS

German Road Plant

THE necessity of road surface stability, with the ever-increasing traffic density, is becoming more than ever essential. Pegson, Limited, of Coalville, Leicestershire, with this problem in mind, have concluded an agreement with Wibau, of Gelnshausen, Germany, to build under licence in this country their range of specialised asphalt and bituminous macadam plants. Nine standard types, both portable and fixed, of drying and mixing plants will be built by Pegson, Limited, with capacities from five to 120 tons per hour.

Asphalt Tanking

The Excel Asphalte Company, Broadway Chambers, Hammersmith, W6, inform us that they carried out the whole of the asphalt tanking to the basement of Reading Technical College, Berkshire, which was illustrated in *The Builder* of May 18.

Dry Rot Solution

A solution called Selonol W has been produced by Dr. P. R. Masek (Research Laboratories), 14, Randolph-road, W9, which, it is stated, has a protective effect against the attacks by dry rot and noxious insects. It has been tested by the Forest Products Research Laboratory of the DSIR where it was pronounced toxic to wood-destroying fungi.

Dust and Concrete

By the use of a new formula of resins and oils a concrete floor can be made into a smooth, tough dustless surface it is claimed. The material is manufactured by Watco (Sales), Limited, 56, Buckingham Gate, SW1. By the use of the material which is called "Watco Concrete Hardener" floors are sealed and cannot cause dust. The hardener has been used all over the world.

Concrete and Moisture

The most destructive and the most costly drawback of concrete lies in its imperfect resistance to water and moisture. To improve stability and render concrete waterproof has been the prime concern of civil engineers for many years. The introduction of "Hydropel" in America and the introduction of the same product under the name of "Bitucrete" in Britain by The British Bitument Emulsions Company, Ltd., Slough, Buckinghamshire, has supplied, it is claimed, an answer. This admix is now being used with success in contracts where it has completely overcome the water or moisture absorption drawbacks of large-scale concrete fabrication in unfavourable conditions.

A loading shovel with 25 cwt. capacity has been produced by W. E. Bray and Co., Ltd., Faggs-road, Feltham, Middlesex. Called the "Bray-loader" BL 30 it is a flexible and speedy machine. The use of positive bucket control given by hydraulic jacks enables the bucket to be used in the manner of a general purpose tool. Other advantages are: capacity loads are assured; the bucket can be carried near to the ground; the load can be discharged slowly or swiftly at will; and bulldozing, backgrading and backfilling are accomplished by rotating the bucket to the optimum position. A wide range of easily fitted attachments are available.

"Stalwart" grubbing tongs produced by W. T. Minett (Sales), Ltd., 130, The Chesils, Coventry, are of great use in clearing land where the use of bulldozers is restricted or not merited. The tongs are hooked on the nearest member of the growth, and will haul out large roots from the ground without previous hand grubbing. The range of tongs can also be used for hoisting concrete blocks and lintols, etc. A feature is a retaining latch which holds the jaws open until they are suitably placed for the next haul.

TRADE NEWS

Ancient Locks

An interesting and informative book on the antique and other locks contained in their museum collection has been published by Josiah Parkes and Sons, Ltd., Bush House, Aldwych, WC2. The collection has been made over the last 30 years, and has now become quite substantial. It not only provides first-hand knowledge of the methods of the company's forebears in the trade, but also demonstrates how much locks have changed in character over the years. The book has many illustrations showing the locks. One of the most ancient shown is an Egyptian lock of the period 2000 BC, made of wood and designed for fixing to the outside of a door. It is constructed on the same principle as the modern pin tumbler lock.

International Removers

Of particular use to firms and individuals wishing to make arrangements for overseas packing, shipping, marine insurance, and other matters related to export, import, emigration or travel will be the service provided by Pitt and Scott, Ltd. This firm, established nearly 80 years ago, specialises in overseas removals and the packing and shipment of antiques and valuables, and a fleet of vehicles and lift vans is operated. Extensive packing shops are included in the organisation, which, while retaining its general shipping business, also acts as official agents for all steamship companies, air corporations and companies and the railways. A booklet giving full details of the service provided is obtainable from the company at 1 St. Paul's Churchyard, EC4.

3,000 Houses in Midlothian

The Lord Provost of Edinburgh, Sir John G. Banks, CBE, visited the factory of Crudens Limited, at Musselburgh, on May 23. The visit marked the occasion of the firm having completed 3,000 houses in the county of Midlothian.

Booklet on Fans

A booklet has been published by Sturtevant Engineering Co., Ltd., Cannon-street, London, EC, on fans, blowers and exhausters. Numbered 2206, it describes fan design and construction, and lists the many kinds of ventilation equipment the firm manufactures.

Manufacturers of Plant

Under the trade name of "Rob Roy," James F. Low and Co., Ltd., Monifieth Foundry, Monifieth, Dundee, Scotland, are to produce various kinds of plant and equipment. Among their products will be 3/2, 5/3½, 7/5 (non-tilt and tilt drum), 10/7, and 14/10 concrete mixers, open discharge and lift and force diaphragm pumps, mechanical dumpers, portable saw benches, roller pan mixers, light rollers, and weightbatching machinery.

Titanium Pigment Film

A film which documents the story of the discovery of titanium pigment, the industrial development and the commercial applications of the element, has been made by British Titan Products, Limited, York. It is called "The Titanium Pigment Story," and 16 mm. prints are available from the firm.

Theatre Design—A New Concept

AN EXPERIMENT BY THE QUESTORS THEATRE

AT the Royal Society of Arts, London, on February 29, MR. NORMAN BRANSON, ARIBA, read a paper entitled "A New Concept in Theatre Design." Mr. Branson, of W. S. Hattrell and Partners, designed the new playhouse to be built at Ealing for the Questors Theatre Limited, and the following are extracts from what he said:

Basically the need to find a theatrical form more satisfying than the picture-frame arrangement sprang, as far as the Questors were concerned, from their own practical artistic experience over the past 25 years. Their early productions were upon a somewhat shallow stage behind a conventional proscenium arch. Then a forestage in front of the picture frame began to be added for some classical plays such as those of Shakespeare and Sheridan. Later this was extended to certain modern plays written in a non-naturalistic vein such as Obey's *Noah* and Denis Johnston's *A Bride for the Unicorn*. This was done largely for utilitarian reasons to gain more space and to facilitate the flow of the play by giving, in effect, two playing areas—the mainstage and the forestage—between which the action could alternate as desired. It was found in practice that the use of the forestage resulted in a very pleasing and easy relationship between the actor and the audience.

The movement away from the picture-frame stage was probably started in this country by Terence Gray's Festival Theatre at Cambridge which opened in 1926. One thing is clear, however; there is a considerable movement in the theatre to break away from the picture-frame stage. The general direction of that movement also seems clear—towards a closer and more intimate relationship between the actor and the audience and towards a theatrical illusion which, with their collaboration, is created in the imagination of the audience. This form of illusion is quite distinct from that created in full naturalistic detail on the stage with a minimum of contributory effort by the observers. To sense that, however, is still a long way from finding the answer to the question "What kind of playhouse, what shape, what physical arrangement?"

The Questors, therefore, set out consciously—even, perhaps, a little self-consciously—to re-study the basic principles which should govern contemporary theatre requirements. In this and in all stages of their thinking and planning they were assisted by a panel of eminent people of the theatre among whom was Mr. Tyrone Guthrie, Miss Muriel St. Clare Byrne, Mr. John Allen, Mr. George Devine, Mr. Michael MacOwan, Mr. Bernard Miles, Mr. Glen Byam Shaw, Mr. Frederick P. Benthem, Mr. E. Martin Browne, C.B.E., Mr. Norman Marshall, Mr. Osborne Robinson, M. Michel Saint-Denis, Mr. Richard Southern, Mr. André Van Gyseghem and Mr. Michael Warre.

Four problems presented themselves for consideration at the commencement: the optimum distance between the actor and the audience; the size of the auditorium; the grouping of the audience in relation to the actor; and the grouping of the audience in relation to itself. Having isolated the problems, the next step is to consider what shape of auditorium and what stage plan would best combine to promote the desired quality.

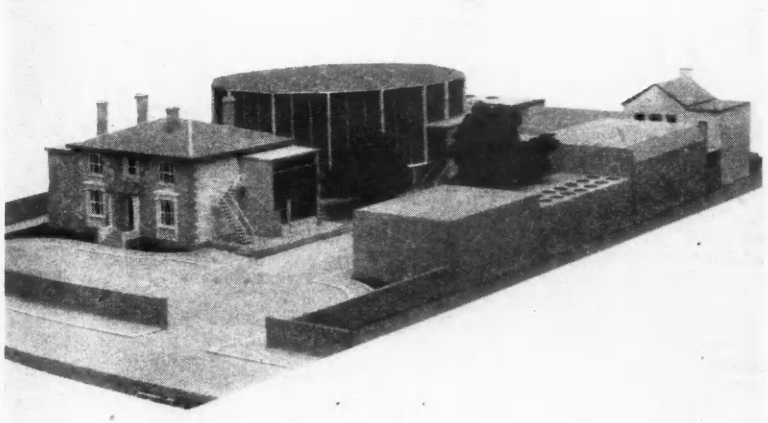
Finding the Right Plan

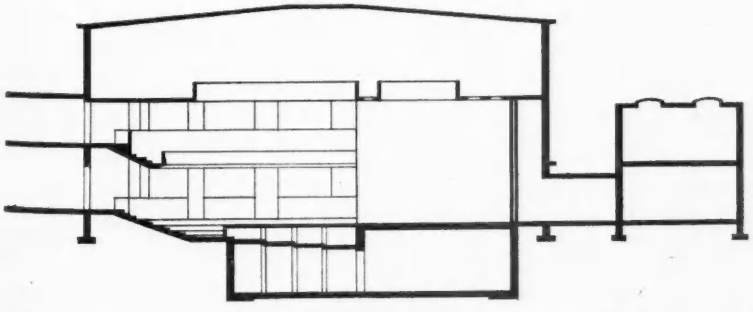
There is the typical cinema plan. If boxes are added together with a circle and a gallery we have a simplified version of the conventional proscenium picture-frame theatre. An extension of the main stage can be made with the provision of a forestage. A different arrangement is the provision of an open stage set completely outside the proscenium wall with the audience seated on three sides of the stage. The last design is one where an auditorium is wholly surrounding the stage as in a circus or at sporting tournaments.

At this point the case for an adaptable theatre was considered. The case for an adaptable playhouse is rather that at this moment, when the theatre is in a state of flux, it is not yet possible to determine with certainty what kind of playhouse is wanted. Therefore it is desirable to have two- or three-in-one in order to experiment with them all and thus to discover the line along which to develop. The degree of flexibility required a stage-auditorium relationship to permit production on a picture-frame stage with the acting area confined wholly within the proscenium arch; a proscenium stage with a forestage; an open stage; and an arena stage.

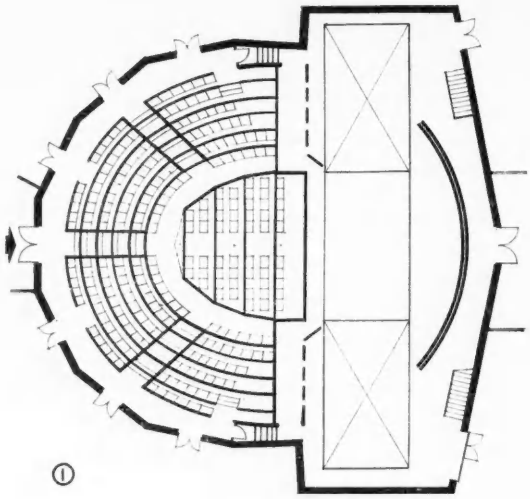
The basic shape of the auditorium was first established by resolving such practical problems as the angles of sight lines necessary for uninterrupted vision, the direction of the seating to provide comfortable posture for each stage use, the local authority by-laws and their concern for widths of gangways, the number of seats in each row and the position of entrances and exits. It was also necessary to evolve a shape capable of giving the actor-audience relationship previously mentioned for each use without destroying the sense of unity of the whole.

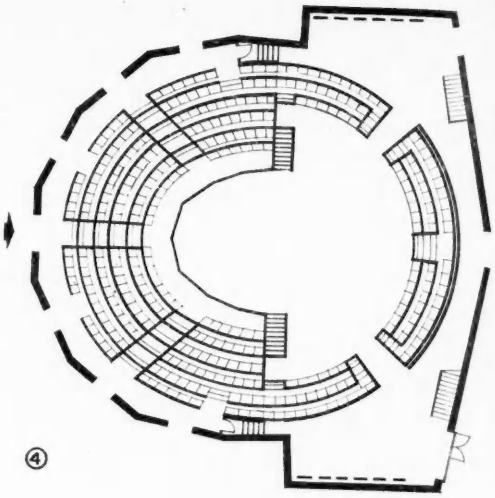
To achieve the desired degree of flexibility it was considered that whichever form the proscenium wall took it should be capable of providing any width of opening between the walls of the auditorium. This led to the design of metal screens sliding in tracks hung from above. The screens, which could be either manually or mechanically operated, could be readily moved into stage use or parked in the wings. Further consideration towards this end led to the idea that

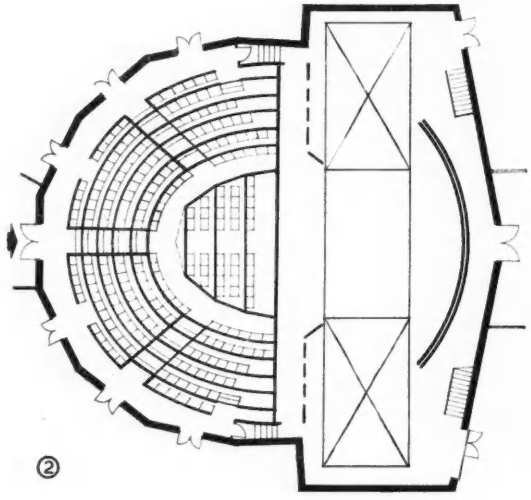


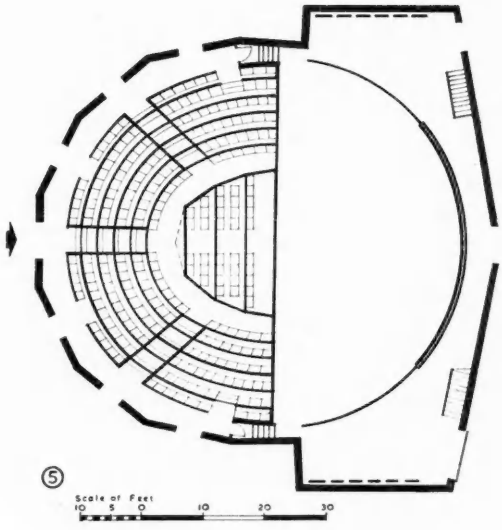


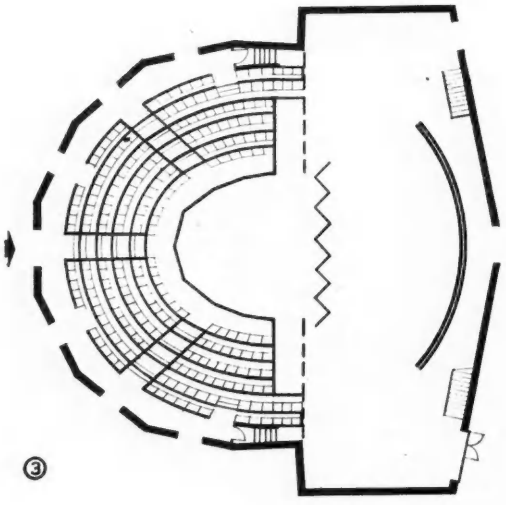
Above: A model of the completed theatre. Below: Long section drawing of the adaptable playhouse.



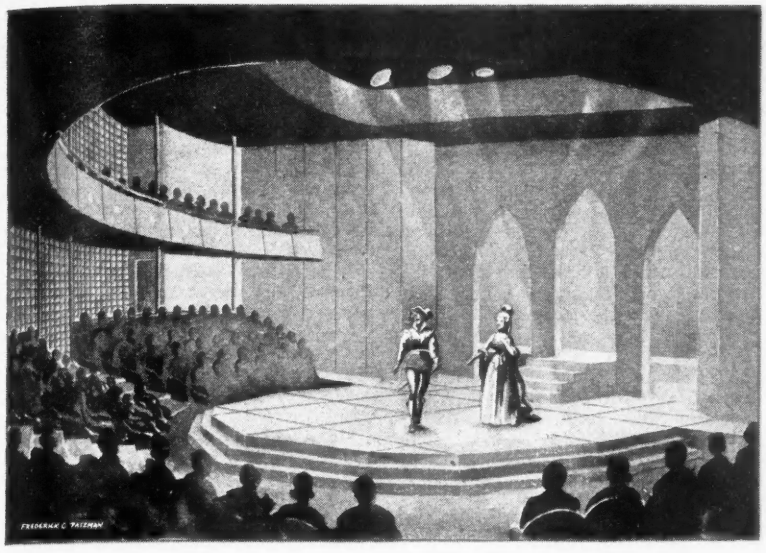








(1) The proscenium or picture-frame stage. The seating capacity is 337. *(2) The second use is the proscenium with forestage which is obtained by removing one or more rows from the pit and extending the stage towards the auditorium. Seating with a ten-foot wide forestage is* 315. *(3) The open stage, which seats* 359, *is obtained by removing all the seats from the pit. (4) The arena stage, seating* 461, *completely encircled by the auditorium. (5) The space stage, seating* 397, *which provides a semi-circular stage enclosed by an horizon.*



A view from the auditorium looking across the " open " stage.

the small stepped pit area could be filled with movable platforms, thereby providing a forestage and, if extended over the whole area, an open stage could be formed. When not required for stage purposes, the pit would accommodate seating and the platforms stored beneath the main stage.

" Theatre Atmosphere "

At this time the design of the lighting gallery was clarified and it was established within the ceiling over the auditorium and the main stage. The shape of the gallery, following the plan of the auditorium and of the stage, forms two voids in the ceiling separated by a bridge situated over the proscenium line and from which the metal screens could be hung. The lighting from this gallery and the bridge could be directed from any angle towards the stages.

Whilst the various factors were crystalizing into definite plans, it had to be borne in mind that the essential quality of " theatre atmosphere " must not be surrendered and that the ultimate design must suggest a place of entertainment and not a workshop.

The picture-frame stage designed for the Questors consists of six rows of tiered seating with the rear row enclosed to form boxes to assist the creation of theatre atmosphere. Seven rows of tiered seating is planned in the pit parallel with the stage. Three further rows of seats are accommodated in the balcony which encircles the auditorium and terminates on the line of the proscenium. The picture-frame opening is formed by the metal screens which are slid into position parallel with the front of the stage to give any desired width of opening, although it is anticipated that an opening 24 feet wide by 20 feet high would normally be used. The innermost screens are articulated to form tormenters should they be needed. The acting area can be permanently set or changed by means of the wagons. The stage is fully trapped to give access to the basement below. The rear of the acting area is enclosed by a permanent cyclorama behind which is the access to the dressing rooms, wardrobes and workshops *via* a firecheck lobby. The seating capacity for this use is 337 and of course is determined by the sight lines.

The second use of the theatre, that as a proscenium stage with forestage, is obtained by removing one or more rows of seating from the pit and extending the stage thereover towards the auditorium. The forestage thus formed can be of any depth but standard sections of platform have been designed in five foot multiples. The access to the forestage is from either side, from the main acting area or *via* stage openings from beneath as the standard platforms coincide with similar sized removable sections in the floor of the pit. It is possible to vary the height or the shape of the forestage by the use of rostra of differing dimensions.

The forestage is not intended to be used only whilst sets are being changed on the main stage but as an extension of the main stage. This being the case it is necessary for scenery to be erected thereon and to be changed. This is possible by reason of openings formed in the metal screens and these are capable of receiving door sections or flats. The seating capacity for this use, with the ten-foot wide forestage, is 315.

The Orchestra's Place

Should an orchestra be required, it could either be placed within the pit area, particularly when an opera is being performed, or it could be stationed in the gallery.

The third use of the open stage is obtained by removing all the seats from the pit and filling the area with the standard platforms previously mentioned. Additional seating is introduced at the sides, which more than compensates for those lost from the pit. The seating capacity for this use is 359.

An arena stage is formed by sliding the metal screens away from the front of the stage. This completely opens the main stage area and, from within the cyclorama cavity, curved panels are withdrawn to join the main structural walls. These panels, together with the cyclorama, provide a background in front of which three rows of tiered seats are placed to complete the enclosure of the arena stage. Access to the stage is either *via* the openings between the seats or from beneath the stage. This arrangement would ensure a high sense of audience-participation and would be invaluable for certain types of play or spectacle produced wholly in the round. The seating capacity is 461.

Achieving Flexibility

When the planning of the Playhouse had proceeded thus far it was found that a further distinct use could be obtained from the facilities already created. This is particularly interesting because it suggests that the basic design is capable of greater flexibility than originally envisaged, and in the hands of an imaginative producer still further uses may be evolved. The arrangement has been christened the space stage and is formed by clearing the main stage area and extending the curved panels from the cyclorama to a point five feet from the structural walls, thus providing a semi-circular stage enclosed by an horizon. In the auditorium, the seating may be returned to the pit, giving a capacity of 397. The playing area thus formed enables the producer to create his production with complete freedom of style and to incorporate therein an essential theatrical use of space.

In this search for a new concept in theatre design, I have tried to discover what traditions are of significance to us to-day, what contemporary thought is based upon mere rootlessness, what compromises are invalid and what compromises have the power of development within them. The adaptable theatre is not necessarily the final solution—indeed, no solution can be a final one. Playhouse design must change and develop in the future as it has in the past. Our present dilemma arises precisely because of the absence of such development in the past eighty years or so. This concept, therefore, is to be regarded more in the nature of an experimental playhouse where the results may lead to the continuance for a time of the flexible theatre as itself answering contemporary needs, or it may lead to the rejection of certain of its uses and to the development of others. The Questors and I have not attempted to choose for the theatre but we have tried to take an important step towards restoring to the theatre a freedom of choice.

Annual Conference

The third annual conference of the Christian Union for the Estate Profession will be held at Church House, Westminster, on June 5. All members of the estate profession are welcome to attend the evening session and hear an address given by Mr. Stephen F. Olford.

BOOKS

*** Books reviewed in these columns may be obtained on application to the Book Dept., "The Builder," 4, Catherine-street, Aldwych, WC2. Cash (which should include 1s. to cover postage and packing) should accompany the order.*

HILL AND REDMAN'S LAW OF LANDLORD AND TENANT. 12th Edition. By W. J. Williams, BA, and Miss M. M. Wills, MA (London: Butterworth and Co. (Publishers), Ltd.). 1,535 pages. Price £5 17s. 6d.

SINCE the last edition of this well-known work was published in June, 1951, there has been a great deal of legislative activity affecting the law of landlord and tenant. In addition to the Crown Lessees (Protection of Sub-Tenants) Act, 1952, the Housing Repairs and Rents Act, 1954, and the Requisitioned Houses and Housing (Amendment) Act, 1955, the legislature passed the Landlord and Tenant Act, 1954, which incorporated many of the recommendations made by the Leasehold Committee in its final report issued as long ago as the middle of 1950. This last Act continued the process of restricting freedom of contract as between landlord and tenant and its most important effect was to provide a new code for the protection of tenants of premises used for business and professional purposes in place of the unsatisfactory system introduced by the Act of 1927.

The recent case law on the subject of landlord and tenant has, as usual, been mainly concerned with dwelling-houses within the rateable limits of the Rent Acts and there have been a number of cases dealing with the difficult topics of "possessory licences" and the rights of a deserted wife in relation to the matrimonial home.

The editors have thus had a considerable amount of new material to incorporate and in doing so, have made an alteration in the arrangement of the book. Previous editions were divided into two parts, "Common Law" and "Acts Affecting Landlord and Tenant," and this division involved a certain amount of overlapping. To avoid repetition, the first part of the new edition under the heading of "General Law" deals with the relationship of landlord and tenant generally and takes into account all relevant statutory modifications, including those made by the Landlord and Tenant Act, 1927 and 1954. The remainder of the book is concerned with subjects which are essentially governed by statute, namely agricultural tenancies, Rent Restrictions Acts and emergency legislation, and sets out the relevant Acts with appropriate annotations. This new arrangement does not involve any fundamental change in the general scheme of the book but makes it easier for the reader to follow a branch of the law of ever-increasing volume and complexity.

The reputation which this work has achieved as one of the leading text-books on the law of landlord and tenant is in no small measure due to the efforts of the present editors who have been associated with it for a number of years. In recommending this new edition, it is only necessary to say that the high standard set by its predecessors has been fully maintained.

G. A. A.

SPECIFICATION 1955. Edited by F. R. S. York, FRIBA. Pp. 1,288. (London: Architectural Press.) Price 30s.

THIS IS the 57th edition of a book that is standard reference for architects, surveyors and municipal engineers. There are 38 sections and they have all been revised to bring the book entirely up to date. References to British Standards and Codes throughout the book have been given detailed attention. The illumination section has been completely revised. In the chapter entitled Roofer, an interesting innovation is two new short articles on reed thatching and straw thatching. The metal worker section has been revised with particular reference to copper alloys. The chapters entitled Structural Aluminium and Heating Engineer have been generally revised. In the latter the tables of approved cookers has been revised for 1955. The latest trends in plastering practice have been dealt with in the appropriate section.

ARCHITECTS WORKING DETAILS. (Volume 3.) Edited by D. A. C. A. Boyne. Pp. 160. Illustrated. (London: The Architectural Press.) Price 21s.

THE MAJORITY of the details in this volume have been published in *The Architects' Journal*. They provide a means whereby architects can exchange information to their mutual benefit. These details contain information of lasting value in an aspect of architectural practice that is rarely recorded. The details are grouped under the following headings: windows, doors, walls and partitions, roofs and ceilings, balconies, covered ways and canopies, heating, lighting, and furniture and fittings. The book is very well illustrated with plans and photographs and is attractively presented. Included is a useful index.

SIMPLE PERSPECTIVE DRAWING. By Arthur R. Brown. Pp. 34. (London: Crosby Lockwood and Son.) Price 6s.

PERSPECTIVE drawing, or the representation on a flat plane such as a sheet of paper of objects as they appear to the eye, presents problems of which man has been aware for many centuries. Unfortunately, to the student perspective drawing often appears to be a mystery that involves constant study of, and reference to, complicated diagrams and instructions. Mr. Brown has dispelled this view by presenting as simply as possible the information and procedure necessary for the completion of straightforward perspective drawings which will form a basis for further study and facilitate the solving of more complicated problems should they arise.

BUILDING CRAFT SCIENCE. By A. W. Nobbs, BSc. Pp. 278. Illustrated. (London: English Universities Press.) Price 12s. 6d.

THE NEEDS of building craftsmen and building students are dealt with in this book which covers the syllabuses of the City and Guilds of London Institute in Craft Science (Intermediate Course) for brickwork, masonry, carpentry and joinery; and that of Craft Science (Second Year) in plumber's work. It is also designed for the various regional examining unions at the same level. The book is illustrated with many diagrams and in some cases photographs. A variety of exercises is given at the end of each chapter and some suggestions for further experiments and tests are included.

DOCTORS' OFFICES AND CLINICS. By Paul H. Kirk and Eugene D. Sternberg. Pp. 218. Illustrated. (London: Chapman and Hall.) Price 96s.

IN WRITING this book, the authors have done more than present outstanding clinic buildings throughout America; they have prepared a guide to the whole problem of organising a clinic group and erecting a clinic building. A complete survey has been made of the most successful buildings of this type; and apart from plans, photographs of interiors and exteriors, the authors give complete information on location, personnel, cost, areas and services.

The book also includes a comparative analysis of rental costs and new building costs—including construction maintenance and depreciation—albeit in American currency.

Mr. P. H. Kirk has designed many clinic buildings in the States; his list of design awards include a Gold Medal Award of the Seventh Pan American Congress of Architects at Cuba for the Crown Hill Clinic, and a Washington State Honour Award in 1953 for the Lake City Clinic. Mr. Eugene Sternberg has recently designed a great number of private medical clinics, particularly in the Rocky Mountains region. He was educated in England and practised architecture in the office of Sir Patrick Abercrombie. He also taught at Cambridge and London Universities before being invited to the United States in 1946 by Cornell University, where he taught until he moved to private practice at Denver.

PRACTICAL DESIGN OF SIMPLE STEEL STRUCTURES. By David S. Stewart, BSc, PhD, MInstCE. Pp. 221. Illustrated. (London: Constable.) Price 18s.

THIS IS the fourth edition of Volume One of a textbook that is a good guide for civil, structural, road and railway engineers and students at technical colleges and universities. It deals with shop practice, riveted connections and beams, and contains the tables which were originally issued as Volume Three. Mathematics have been kept as elementary as is possible in such a work, but the student should have a good working knowledge of this subject if he wishes to study the more complicated structures. The author has taken good care to give full details of each step in the process of making a complete design. The book is illustrated with diagrams and photographs.

MODERN OFFICE BUILDINGS. By Michael Rosenauer, FRIBA, AIA. Pp. 163. Illustrated. (London: B. T. Batsford.) Price 35s.

THIS BOOK deals with every practical aspect of office building, large and small, and is designed specially for the architect, client and property owner. It is illustrated with examples from nine different countries and it discusses in detail the requirements which an office building must meet if it is to function with the maximum efficiency. Beginning with a survey, the author goes on to discuss zoning and orientation, the planning approach and procedure, fenestration, lifts, internal partitions and finishings, mechanical services, catering facilities and æsthetics. Where the book is illustrated with office buildings an added advantage would have been if the full addresses of the buildings had been given.

BUILDING SURVEYS. By F. R. Huggins, ARIBA. Pp. 63, Illustrated (London: B. T. Batsford.) Price 10s. 6d.

TEACHERS AND students of architecture and surveying as well as the qualified man can glean interesting information from this small but helpful book. Beginning with a chapter on the elements of building surveys the book goes on to deal with such topics as equipment, sketching, measuring, plotting, general considerations and the quick survey. The author has enumerated the difficulties that are most frequently encountered in this work and he tells how to overcome them. He describes also the pitfalls to be avoided and he includes a memorandum of those aspects of a building survey which are most liable to be overlooked.

BUILDING TECHNIQUE FOR DOMESTIC AND SIMILAR STRUCTURES. By Edwin Gunn. ARIBA. Revised by John Brandon-Jones, AADip, ARIBA. Pp. 188. Illustrated (London: Iliffe and Sons.) Price 21s.

THIS IS a third edition, with a change in title, of Mr. Gunn's original "Modern Building Technique." The book gives concise information on a wide range of design problems in the construction of small houses and similar buildings. A noteworthy feature is the extensive reference to British Standard Specifications and to reports and bulletins of the Building Research Station and trade associations. The book starts from the very beginning of house erection with a chapter on the Excavator and goes on to follow with Concretor, Bricklayer, Drainlayer, Asphalter, Pavior, Mason, Slater and Tiler, Carpenter, Joiner, Smith and Ironfounder, Plasterer, Plumber, Glazier, Painter, and concludes with two chapters entitled Provisional Sums, and Defects Liable to Appear During the Maintenance Period. Every chapter is well illustrated with diagrams.

THE ELECTRICAL TRADES DIRECTORY. Edited by Norman H. Codling, DFH(Hons.), AMIEE. Pp. 1671. (London: Benn Brothers.) Price 63s.

COMPRISING some 65,000 references and occupying more than 1,600 pages, the 74th edition is classified under appropriate headings and conveniently arranged in sections, to which there is an index. One of the most useful features of the directory is the Trade Names Section, which now contains more than 5,700 names of patented and branded products.

DESIGN OF PRESTRESSED CONCRETE STRUCTURES. By T. Y. Lin. Pp. 456. Illustrated. (New York: John Wiley and Sons. London: Chapman and Hall.) Price 92s.

THIS BOOK covers all phases of prestressed concrete structure emphasising American methods and conditions. It begins with the materials and procedures of prestressing and continues on through loss of prestress, design for flexure, shear, bond, composite sections, continuous spans, prestressed columns and tanks. The book concludes with a compact discussion of economics, fire and corrosion resistance, impact and fatigue strength. About 60 examples, each dealing with a specific point concerning the design of prestressed concrete, are included. Prestressed lift slabs and pre-tensioning products are described. Only elementary knowledge of the strength of materials and reinforced concrete is required for understanding the presentation. The book is very well illustrated with photographs and diagrams.

PRACTICAL GEOMETRY FOR CARPENTERS, JOINERS AND WOODCUTTING MACHINISTS. By R. B. Emary, FBICC. Pp. 185. Illustrated (London: Sir Isaac Pitman and Sons.) 17s. 6d.

THE CRAFTSMEN named in the title of this book are catered for in an easily understood manner. The book covers craft geometry from the first to the advanced stages—from setting out mitres and mouldings, to handrailing and work of double curvature. It is suitable for those students taking the examinations of the City and Guilds of London Institute, The Worshipful Company of Carpenters, The Incorporated British Institute of Certified Carpenters and other examining bodies.

ARCHITECTURAL PRACTICE AND PROCEDURE. By the late Hamilton H. Turner. Revised by John Hamilton Turner, MBE, FRICS. Pp. 339. (London: B. T. Batsford.) Price 21s.

THIS, the fifth edition of a manual first published in 1925, deals with the side of an architect's career that is so important if he is to be a success—business matters. The architect is guided through prices, contracts, by-laws, the nature of sites, materials, plant, trade customs and a host of other intricate details that he must have knowledge of. The reader of the book is asked to imagine himself in various situations and the courses open to him are outlined. The author pointed out in his introduction to the book 30 years ago a motto to follow when dealing with this subject and that is "you cannot be too careful." This motto and this book form a good guide to the many intricacies that have complicated post-war building.

CARPENTRY (Building Craft Series). By W. B. McKay, MScTech, MIStructE. Pp. 223. Illustrated. (London: Longmans, Green and Co.) Price 10s. 6d.

THIS BOOK, the second edition, covers the syllabuses in theoretical carpentry in the first and second years of the courses provided in technical schools in preparation for the examinations of the City and Guilds of London Institute. A chapter on drawing has been included with a view to assisting students to attain a satisfactory standard of draughtsmanship. A chapter has also been devoted to a description of the manufacture, characteristics and uses of plywood and laminboard.

SOLUTION OF PROBLEMS IN SURVEYING AND FIELD ASTRONOMY. By H. W. Stephenson, BSc, AMICE. Pp. 287. (London: Sir Isaac Pitman.) Price 25s.

IN THIS collection of solutions to typical problems in surveying, geodesy and field astronomy the author has tried to include an example of every type of problem likely to be met with in the examinations for the engineering degrees of British universities and in particular the University of London. There is also a list of essential formulæ at the beginning of the book, and brief theoretical backgrounds are outlined in each chapter.

CONCRETE MATERIALS AND PRACTICE. By L. J. Murdock. (Second Edition.) Pp. 367. Illustrated. (London: Edward Arnold (Publishers), Ltd.) Price 40s.

THIS EDITION incorporates advances in concrete techniques made during the last few years, with new chapters on admixtures and the more practical aspect of prestressed concrete. The object of the book is to provide a broad outline of the science of concrete making, particular attention being given to the translation of the knowledge gained by testing and research into practice in the field.

The properties of concrete are described and the basic materials and the technique of concrete making under various conditions and for many purposes are discussed in some detail. Brief mention is made of the design of reinforced concrete, mainly to enable the concrete engineer to recognise errors in bending and fixing the reinforcement. Similarly, examples of formwork are included on account of the importance of careful design and construction to the final result. The chapter on mix design has been completely revised, and the diagrams regrouped for easy reference.

A.B.C. OF BUILDERS' ESTIMATING. By R. G. Bailey. AIAS. (London: Crosby Lockwood and Son, Ltd.) Pp. 30. Price 3s. 6d.

MR. BAILEY'S analysis of building labour constants is intended to provide quick and easy access to data as to the time required for various jobs and the allowances to be made for such contingencies as waste in cutting or loss of bulk in mixing certain materials, for insurances, holidays with pay and other incidentals.

This is the fourth edition of the book, which was first published in 1947. The continued demand for it is perhaps its best recommendation.

BUILDING PLANNING AND DESIGN STANDARDS. By Harold R. Sleeper, FAIA. Pp. 331. (New York: John Wiley and Sons. London: Chapman and Hall.) Price 96s.

THE PURPOSE of this book is to fill an existing gap in available literature on specific types of buildings. Some of the buildings covered are: small homes, schools, stadiums and grandstands, banks, air terminals, doctors' offices, churches and theatres —in all the book deals with 23 basic kinds of buildings. Naturally the book has a leaning to architecture peculiar to America. However, there are many details that have an international approach and should be of great interest to architects in this country. The book supplies information for programming, making preliminary drawings, and assists in establishing areas and cubage. A helpful factor is a bibliography placed at the beginning of each section, covering reference material which includes matter beyond the scope of the book. This is a useful book for schools and drawing-offices and is a good work of reference for architects, engineers, designers, draughtsmen and students.

BOOKS RECEIVED

FUNDAMENTALS OF CARPENTRY. Vols. 1 and 2. By W. E. Durbahn. (London: The Technical Press, Ltd.) Price 34s. Vol 1 and 42s. Vol. 2.

Prestressed Northlight Shell Roofs

PROBLEMS OF DESIGN OVERCOME IN A LARGE ROOF AREA OF A SWISS FACTORY

The following article by Mr. F. Berger, Dipl. Ing., is abstracted from the September, 1955, issue of "Schweizerische Bauzeitung," brought to our attention by the Cement and Concrete Association. In it the author describes the construction of the roof of a factory for the Langendorf Watch Company. The factory has now been completed after a construction period of two years.

AT Langendorf, near Solothurn, Switzerland, the structural work on the factory building of the Langendorf Watch Company has been completed after a construction period lasting two years. This building consists mainly of about 15,000 m.² of mushroom floor designed for a superimposed loading of 2 tons/m.² with columns spaced at 7.75 m. and 6.00 m. centres.

The roof structure consists of prestressed concrete slabs of 12 m. span and northlight shells spanning 24 m. The cubic content of the building is about 100,000 m.³. The mushroom floors were calculated in accordance with the normal standard theory and the design was supplemented by tests carried out on models by Prof. Dr. P. Lardy at the institute for Structural Statics and Building Construction of the Swiss Federal Technical University. These model tests made it possible to adopt a more economical design and led to the elucidation of several problems.

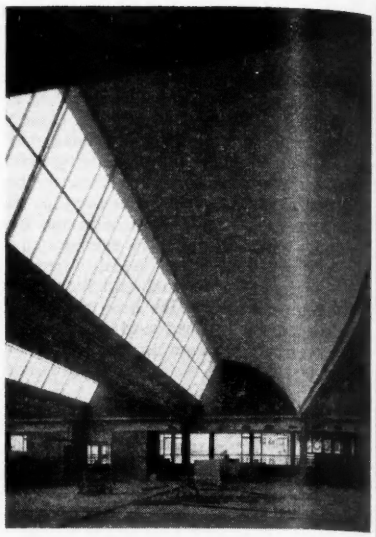
A particularly interesting feature of the new building is the roof structure, which has a plan area of 5,800 m.². The designers were faced with the problem of covering a central area of 2,600 m.², which had to be free of columns, and two lateral areas of 1,300 m.², which likewise had to be free of columns and cross-beams. The two lateral bays were covered with 30 cm. thick prestressed slabs spanning 12 m. The central hall is meant mainly for production purposes and had to be appropriately designed ; it was essential to obtain the best possible working conditions. A northlight construction was considered to be most suitable for meeting the requirements. After exhaustive investigations and cost comparisons, prestressed concrete northlight shells were chosen and turned out to be highly economical.

General Features

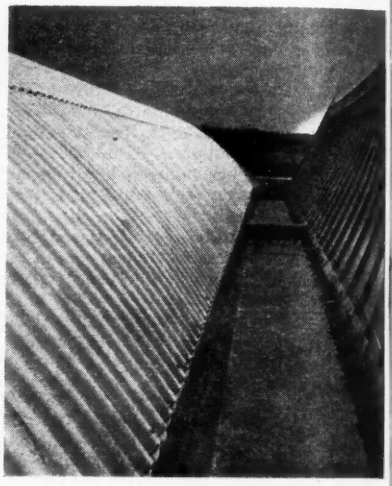
In order to suit the construction procedure employed, the northlight roofs had to be built separately and quite independently of one another ; the considerable deformations due to the prestress (occurring at widely different times) precluded the provision of any connection between the roofs. The designers therefore decided to depart from the traditional method of northlight roof construction and to dispense with supporting members in the plane of the glazing.

These are probably the first northlight roofs of such large span to be built as freely spanning cylindrical shells without any support of the upper edge of the shell. This requirement determined the nature of the prestress and the positions of the cables. Thus, practically straight cables (at the upper and lower edge of the shell) were chosen for the first time. The shell, which has a thickness varying from 8 to 9 cm., terminates at its lower edge in the valley girder, which serves as an air conditioning duct and gutter for rainwater. At the upper edge the shell is thickened for accommodating the prestressing cables, this thickening being formed externally.

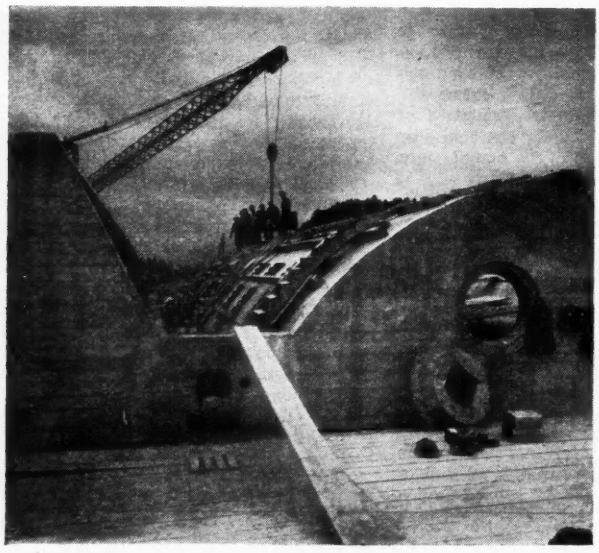
The stress conditions for such northlight shells under external loads (self-weight, snow and wind) were calculated with an adequate degree of accuracy by

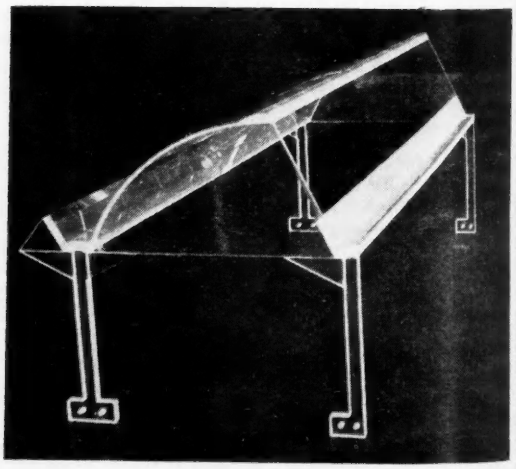


Internal view of the prestressed shell roof.



The completed valley gutter.





Above: The plexiglass model scaled at 1:30. Left: Positioning of the anchorages of the prestressing cables.

means of the elastic theory and also according to statical methods (beam analogy); a sufficient number of test results and measurements are available to ensure the reliability of these calculations.

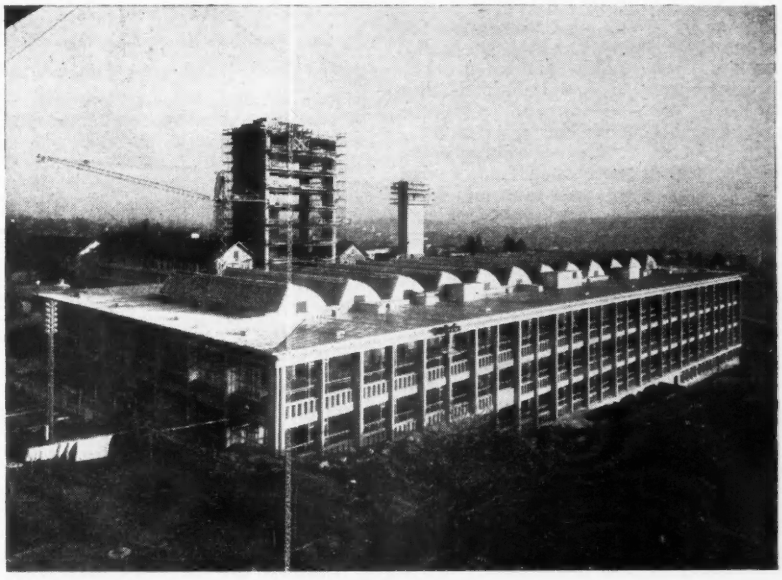
Model Tests

The effect of the prestress, however, cannot be adequately analysed by means of the elastic theory. At the same time, the effect of the prestressing forces is of essential importance in the design of the structure, so that the designers decided to verify and supplement the assumptions and calculations with the aid of a model test. In addition, the model test helps to elucidate various other important problems, such as determining the deformation of the upper edge member (which has no supports in the glazed area), the behaviour of the shell under concentrated loads, and the stability of the shell. A model was constructed and tested by Prof. Dr. P. Lardy and his assistant H. Hauri, Dip. Ing.

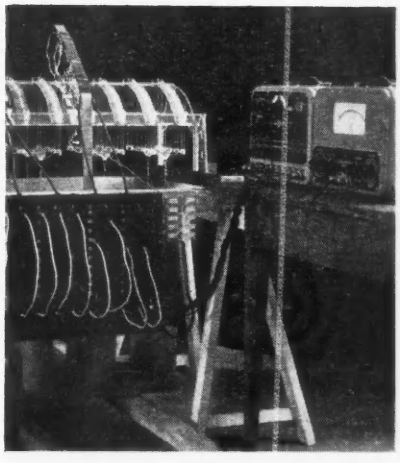
On the basis of previous experience, plexiglass (Perspex) was chosen as the material for the model. This material behaves elastically in the range of stress concerned. Also it is capable of being cut with a saw, holes can be bored in it, it can be bent, and perfectly strong glued joints can be formed, so that models of any desired shape can be made. The modulus of elasticity is approximately 32,000 kg./cm.^{2} and is determined in each case by preliminary tests. Poisson's ratio γ is 3.5 and is therefore higher than for concrete ($\gamma = 0.16$). The differences in stress distribution due to this are estimated to be slight in the present case. A scale of 1:30 was chosen for the model. The curved shell was bent to its correct shape at a high temperature between two steel plates having the exact amount of curvature. All the other parts consist of glued flat plates and bars.

The loads acting upon the model were split up into 64 concentrated loads, the forces acting upon the thin shell being distributed over larger areas by means of distribution plates provided with rubber pads. These loads were combined in groups of eight, each group being acted upon by a single force of 3.24 or 4.2 kg. operating through an accurately functioning system of levers with ball and roller bearings. For applying the prestress, a system of levers was developed whereby it was possible to transmit an accurately determined compressive force to the model.

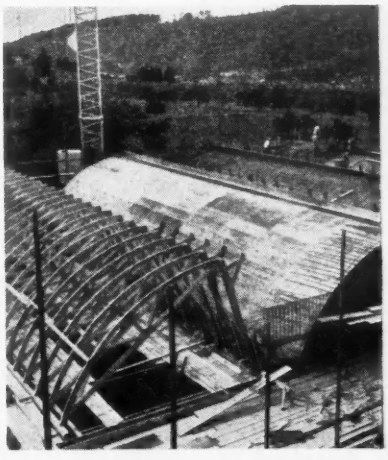
62 Philips GM 4474 electrical resistance strain gauges were affixed to the model in order to measure the strains. At mid-span these gauges were distributed over the cross-section in such a way that they enabled the longitudinal stresses and the transverse bending moments to be determined, whereas at the outer eighth and quarter points of the shell the strain gauges were arranged in a star pattern (three gauges at 120 degrees) for determining the principal stresses. The changes in electrical resistance were measured with a Philips GM 5536 directly-indicating electrical measuring bridge in conjunction with the requisite distributor devices. Sixteen compensating strain gauges, which were likewise stuck on to plexiglass, were used for the compensation of temperature influences.



The almost completed factory. The architect was K. Hirschbühl and the contractors Arbeitsgemeinshaft R. Bannwart and Cie.



Testing a model. Tests showed that the theories for cylindrical shells were accurate, the discrepancy never exceeding 10 per cent.



Formwork and reinforcement. On the left are seen the template ribs on which the formwork panels are laid.

The model tests show clearly that the well-known theories for cylindrical shells are sufficiently accurate with regard to external loads. In no case does the discrepancy between the test results and the calculated values exceed 10 per cent. The measurements show that the prestressing forces concentrate at the edge members (see: Timoshenko: *Theory of Plates and Shells*) and considerably reduce the principal tensile stresses, so that these are of some importance only over the end eighth parts of the span.

Loading Tests

Detailed calculations and model tests having been carried out, it was of especial interest to obtain a comparison with the behaviour of the actual structure by means of comprehensive loading tests. These loading tests were carried out by the Federal Materials Testing Laboratory.

Prestress

The effect of the prestress was tested on three roofs by means of repeated application of the prestressing force of 400 tons. As was to be expected, the prestress tended to concentrate in the edge members and caused a "hogging" of the shell of more than 5 mm. at mid-span, so that it was lifted off the centring and thus "struck" its own formwork. Thanks to the simple form of prestress chosen (straight cables) it is possible, except for slight principal tensile stresses at the edge, completely to eleminate tensile stresses, so that the concrete can be considered as free from cracks.

A uniformly distributed load of 1 ton/m. was applied to roof No. 2 by means of

24 tons of cast iron slabs. The deflections of the lower edge were not quite 1.5 mm., i.e., less than 1/16,000 of the span. The strains and deflections measured were in agreement both with the calculated values and with the measurements carried out on the model.

In order to test the behaviour of the shell under a concentrated load, a load of 4.5 tons was applied at mid-span, which produced a deflection of the lower valley girder of about 1 mm. (1/24,000 of the span).

The loading tests largely confirm the measurements and the results of the model tests.

Execution

In conformity with the construction procedure adopted, formwork was erected for three roofs at a time, so that four uses could be obtained from the bracing and forms. In order to keep the cost of the formwork as low as possible, the cylindrical shape was approximated by adopting a prismatic (polygonal) structure. In this way ordinary formwork panels could be used, which were laid upon template ribs. As each roof is quite independent of the others, it is in principle sufficient to employ only one set of centring which can be re-used a number of times.

The system applied was the BBRV system of Stahlton A.G., Zürich, which proved very satisfactory. The cables were straight and were laid directly upon the untensioned reinforcement, so that no special steps had to be taken to fix them. The prestressing force of 400 tons per roof was applied in two stages. Shrinkage cracks in the thin shell slabs were avoided by applying one-third of the prestress (133 tons) at three to five days (depending on the cube strength), the full prestress being applied at 20 to 28 days and the formwork removed.

In order to obtain an accurate verification of the behaviour of the prestressing wires, each tensioning head of the cable was taken off prior to grouting (at 35 to 40 days), the force was checked and the cable re-stressed (where and if necessary), whereby the losses due to creep of the steel and concrete as well as shrinkage losses were compensated.

The basic system for this reinforcement consisted of a top and bottom orthogonal network of bars, with a mesh width of 20 cm., strengthened in the edge zones.

Concrete

The grading of the gravel-sand aggregate conformed by and large to the EMPA curve and was supplied in two size ranges (viz., 0–7 mm. and 7–(15mm). Average compressive strengths of 500 kg./cm.^{2} were obtained with a cement content of 350 kg. per m.^{3} of concrete. Plastiment, supplied by the firm of Kaspar Winkler, improved the workability of the concrete and its denseness by reducing the amount of water.

The first three roofs were left without any covering finish for more than a year, so that their behaviour could be accurately studied. Although they were exposed to all weather conditions, no cracks were observed. This fact is of importance in connection with possible future structures without any covering finish.

IN PARLIAMENT

By Our Parliamentary Correspondent

Fire Precautions in Factories

URGENT action by the Government to deal with the installation of fire alarms and escapes in factories in Britain was announced by MR. ROBERT CARR, Parliamentary Secretary, Ministry of Labour, in the House of Commons on May 18. Mr. Carr was replying to a debate on the motion for the adjournment of the House for the Whitsun recess until May 29—arising out of a fire at a mill in Keighley in which several persons lost their lives.

He revealed that there was widespread and serious evasion of compliance with the provisions of the Factories Act relating to the compulsory installation of fire alarms. It was estimated that between 50 and 70 per cent. of the factories in Britain which were covered by these provisions were without such systems of alarm. An extensive degree of non-compliance could not be permitted, and the Ministry would do their best to see that it did not continue.

The chief inspector of factories would be writing to all the occupiers of the factories involved, estimated to number between 40,000 and 50,000, reminding them of their obligations. The Minister had decided that officers of employment exchanges would assist the district inspectors to carry out a rapid survey of factories by personal visits, and in the light of that investigation the Minister would decide what further action was necessary, and if so what that action should be.

The Ministry would be publishing a simple leaflet about fire alarms and their installation as well as a booklet about fire precautions and means of escape. Both of these publications would be dealt with urgently.

Ministry inspectors, said Mr. Carr, were making a special drive about fire risks in the mills in the area in which this tragedy occurred. MR. HOBSON, the local member, who drew attention to this matter, said that death-trap conditions existed in many mills.

The Aswan High Dam

ANOTHER QUESTION which was discussed before the House rose was the Aswan High Dam project on the River Nile. Political considerations weighed heavily in this discussion, but many members doubted the feasibility of Britain participating in this scheme on technical grounds. MR. DODDS-PARKER, Under Secretary, Foreign Office, who replied, pointed out that the project, which would cost about £400m., was not the result of a sudden decision, but of years of study and exploration by civil engineers and others.

The experts who had advised that the scheme was technically sound represented many nationalities. Economic and engineering advice had been taken into consideration. The cost of the civil works on the dam would be less than one fourth of the £400m.: the remainder would cover irrigation, which would be required in any scheme, and other items.

Restrictive Trade Practices Bill

AMONG the other business which was disposed of during the week before the House dispersed was the committee stage of the Restrictive Trade Practices Bill which was concluded on May 17. After seven days of scrutiny, in which all the principles involved had been thoroughly canvassed, the Bill was then got one stage nearer the Statute Book. Mr. Thorneycroft, the President of the Board of Trade, aided by Mr. Derek Walker-Smith, his Parliamentary Secretary, has done a skilful piece of parliamentary work in piloting this complicated legislation through the House. It will be no fault of theirs if the Opposition remain unconvinced that it will do what the Government say it ought to do, and what the report of the Monopolies Commission, on which it is based, sought to achieve.

OTHER BUSINESS

Housing Costs

MR. ENOCH POWELL, Parliamentary Secretary to the Ministry of Housing and Local Government, in a written reply on May 18, stated that the average cost of a three-bedroom council house built in 1948 was £1,295 and the interest charges were £46 13s. 6d. The corresponding figures for 1955 were £1,442 and £76 0s. 7d.

In another reply, he stated that up to the end of April 349 local authorities in England and Wales had sold 5,825 council houses. In addition, six development corporations had sold 45 houses.

Slum Clearance, Oldham

MR. LESLIE HALE asked the Minister of Housing and Local Government whether he was aware that some 14,000 houses in Oldham were considered as needing clearance or rebuilding; and what action he was taking to assist the corporation in their proposals for dealing with the problem.

MR. POWELL: the Minister is aware that Oldham have a difficult problem, and he has arranged for officials of his department to discuss it with the council.

Pavement Widening

LIEUT.-COL. BROMLEY DAVENPORT asked the Minister of Transport on which of the London carriageways which he had listed as being carriageways where widening would ease traffic congestion, the carriageway would be widened at the expense of existing wide pavements to assist traffic; and whether he would suggest to highway authorities that this be done in cases where the widening of the carriageway was not proposed and where pavements were unnecessarily wide.

MR. HAROLD WATKINSON, in a written reply on May 18, states.—I hope that in time widening of the carriageways will be carried out at most of these places. The responsible highway authorities are well aware of the desirability of widening these carriageways, but must take account of financial considerations and relative priorities.

London-Yorkshire Motorway

SIR FRANK MARKHAM asked the Minister of Transport when work was likely to be commenced on the actual construction of the London-Yorkshire motorway, particularly that part which would pass through Buckinghamshire.

MR. HAROLD WATKINSON: The construction of the motorway cannot be authorised until I have made the scheme under the Special Roads Act, 1949, and completed negotiations for entry onto the land required. I have given instructions for these statutory processes to be pressed on, but they will still take a considerable time. I intend to authorise the construction of the London-Birmingham section of this motorway as soon as I can.

Development Plans and Industry

MR. BEAUFOY'S PAPER AT THE RICS

AT the Royal Institution of Chartered Surveyors, MR. S. L. G. BEAUFOY, CBE, FRIBA, P-PTPI, recently, read a paper entitled "Development Plans and Their Provision for Industry." The following are extracts from his remarks:

The first point I wish to put to you—and of course it is by no means new—is that industry and the employment springing from it are fundamental to all the activities with which town and country planning is concerned. Industry—and in this context I mean the whole range of productive and ancillary activities from mining and agriculture to retail trade and office work—is not only itself an important land user: it is the basis of all land use inasmuch as it determines both the numbers and the geographical distribution of the population for which land use provision has to be made.

More fundamentally, development plans are concerned with the economic structure of communities, since it is on this that everything else depends. The economic structure is conditioned by the kind and amount of employment available in the locality, whether there is a reasonable balance of skilled and unskilled, manual and non-manual occupations, whether there are adequate openings for young people and perhaps for married women seeking part-time employment. One has only to look at places where the economic structure is unsound to see the nature of the planning problems that may arise.

In some areas the weakness in the economic structure takes the form of dependence to an excessive degree on a declining industry. Dependence on a single industry may sometimes give rise to difficulties even when the industry is expanding and there is no question of insufficiency of total employment. In circumstances of full employment there may be little immediate scope for diversification of industry, but there is still a case for promoting forms of development which will give expression to the need for greater variety of social life.

At Corby a new town development corporation has been set up, mainly, it is true, to complete a town which will comprise a majority of steel workers, but in so doing it is introducing other forms of industry which already include corset-making, a shoe factory and a biscuit-packing firm.

The problem of economic stability is not of course confined to industrial towns. Everyone knows that the countryside, even in those parts where the agricultural basis is healthy, has tended to lose population as a result of the competing advantages of town life.

We all know in a general way that the existing pattern of basic industry—coal and steel, engineering and textiles—has been determined by a combination of factors which gave certain areas an advantage over others. These advantages in the course of time became cumulative, so that once an industry had established itself in a locality, it tended to attract more industry of the same kind until it produced a concentration.

Whatever the original location factors and no matter whether they continue to operate at the present day, the concentrations of industry and of industrial population resulting from them have tended to expand cumulatively for two reasons. In the first place, newcomers to an industry found it advantageous to settle in places where there was a pool of labour with the sort of skills they employed or where there were other firms engaged at the same or higher or lower stages of production—this made for efficiency and up to a point reduced costs of production. In the second place the very existence of large concentrations of population attracted industries which had an eye on the consumer markets and aimed at saving in their costs of distributing the final product. These reasons go far to explain the continuous expansion in population and employment in the Greater London area.

Now what, if anything, can planning action achieve with regard to industry? We know that there are location factors which in certain cases cannot be disregarded except at some cost to the national economy. But there is also a good deal of new or expanding industry which can equally well be located in any one of a number of places even though its inclination, i.e. the inclination of its sponsors, is to push into the crowded centres. The Board of Trade applying a distribution of industry policy intended primarily to diversify and strengthen the economy of the development areas, has had considerable success in diverting the flow of new industry away from over-expanded areas—nearly half the total factory building since the war has gone into the four regions containing the development areas.

PROBLEMS OF LOCATION

It is one thing to try to influence the location of new industrial projects in such a way as to improve employment distribution throughout the country. It is quite another thing to secure the removal of existing industry to a new site. Existing location, though it may no longer have any good reason behind it, attaches to itself a vested interest against change—it becomes involved in a web of custom which partly blinds the people concerned to the real disadvantages that exist and the real advantages that might ensue from a change. A "going concern" is more than a physical land use: it is a focus of personal and business relationships which cannot lightly be disturbed. Nevertheless some disturbance there must be. The redevelopment of obsolete areas cannot be put off for ever. Progress will be greater and easier if planning powers can, without sacrifice of other proper requirements, be applied at those points and at those moments of time when change is imminent and natural.

The student of industrial development patterns is naturally interested in comparing the proposals contained in development plans with what is actually happening in the country. In practice the five-yearly review of plans provides the opportunity for stock-taking, but owing to the relatively short time that has elapsed since development plans were prepared it is not possible at this stage to undertake a thorough review.

It may be of interest, however, if I give you an idea of what is going on in London. The policies advocated by the planning authorities for London and the home counties are substantially based on those proposed by the Barlow Commission. They include a halt to the further physical growth of the metropolis and many proposals to remedy the defects of congestion. To what extent has post-war industrial development followed these policies? In the Greater London area a considerable amount of new industrial building, particularly immediately after the war, was blitz replacement. However, during the last few years we find that the London area has received an increasingly large share of permissions for industrial building. This revival of pre-war trends has occurred despite the general Government policy of making new industrial building in the London area the exception and to permit it only when it is essential to the national interest and when it cannot be undertaken elsewhere.

At the same time we must not lose sight of the fact that considerable industrial dispersion to the new towns has already taken place, and there does not appear to be any serious difficulty in attracting industrialists to these expanding centres. By June of last year no fewer than 168 firms, employing 24,000 persons and covering 4.3 million square feet of factory space, had set up production in the new towns around London.

But decentralisation of London's surplus population does not end with these new town projects and the setting up of London County Council out-county estates: there are schemes in hand or in mind for the dispersal of population and industry to other places in counties adjacent to London. Letchworth, Huntingdon, and Haverhill are amongst those that have been mentioned in this connection. With encouragement from the Town Development Act, other areas farther afield have now been selected as suitable to receive some of London's overspill.

Plans coming from the development areas over the whole of the country all mention the need to encourage more industry to settle there. Since the war more than one-quarter of all industrial building granted location approval has been in the areas scheduled as development areas; by the end of 1954 about one-third of known factory completions were in those areas. These new industrial projects have been set up in areas which had in mid-1954 less than one-fifth of the insured employees engaged in manufacturing in Great Britain. So you will see that these areas have done rather well. The new factories cover a very wide range of industry and thus provide some diversity of employment. The need to encourage further new industries in development areas remains because the plans for the future working of coal in many of these areas indicate that the process of declining employment in mining is not yet at an end.

Does the case for decentralisation need any further argument here? The new towns, as well as other individual examples of decentralisation, are already proving the values of collective siting, of adequate space with room for expansion at reasonable cost, of a more efficient centre for distribution, a planned provision of public services and of other facilities. The proximity to markets sometimes argued in favour of the large urban concentrations, obviously has validity in certain cases, but it is becoming ever clearer that location in crowded areas near to markets may be offset to a high degree by disadvantages in other directions. Views are changing too as to the practical value of the bigger labour pool in large urban areas. Full employment has done much to destroy this concept and at best it may only be a matter of cut-throat competition for the available labour.

Industry and commerce are the core of the country's prosperity. It is therefore essential that the proper requirements of their location should be thoroughly appreciated and assisted by the planner. On the other side of the picture the industrialist is proving by experience that the genuine requirements of land-use planning very often operate not only for the public benefit but his own. The development plans present a unique opportunity of stating clearly the underlying policy of the planning authority regarding industrial location and redevelopment, and in the application and implementation of that policy the planner can do much to maintain and further the prosperity of his area and the country as a whole.

INCENTIVE AND BONUS SCHEMES ANALYSED

How the Building and Civil Engineering Industries can Benefit

By C. J. CHAMONT

A QUESTION that seems to be recurrent in the course of contemporary building in the United Kingdom is that of the possible adverse effect of incentive or bonus schemes upon the standard and quality of construction, coupled with the adverse effect of the lowering of such standards upon the trainee or apprentice craftsman.

There is no doubt that throughout the country of recent years and indeed at present there is an extreme shortage of both skilled and unskilled labour. This shortage can be attributed in the main to the following factors which are in most cases unavoidably linked with the nature of the work itself:

(a) The operative is required to work on a contract in an area where his employer has elected to operate.

(b) He must of necessity be prepared to work sometimes under adverse weather conditions, nearly always in the open.

(c) He must be prepared to accept welfare amenities the standard of which is not as high as other physically more stable industries, i.e., factories, etc.

(d) A large proportion of operatives must be prepared to (i) either travel long distances daily, or (ii) remain in a hostel or lodgings for weeks at a time.

(e) The operative must be prepared either to accept dismissal as a journeyman when his work is completed on a site for a particular firm or agree to transference to another site.

In the face of this rather formidable list it is not surprising that with the attractions of other industries in his home area the operative, as has happened all over the country quite recently, elects to leave his trade and seek employment that offers an amelioration of these adverse conditions.

The employer, then, is left with a particular problem, a limited labour field from which to choose the best labour available and the means of attracting such labour to his employ.

Since, as mentioned previously, most of his difficulties are those inherent in the industry, he must publicise other inducements by way of some compensation for these intra-industrial problems by which he is beset, and he chooses the obvious remedy of offering financial gain to the labour field. It must be recognised that some improvements have been made to the above factors by the employers in consultation with the various operatives' trade unions; these have been incorporated in working rule agreements, and are subject to continual revision as new suggestions recommend themselves. Nevertheless, the inescapable factors of better conditions with higher earnings from "piece rates" in other industries offer strong competition.

So-called "piece-work" is nothing new to the engineering industry. Some systems go back as far as the early years of the Industrial Revolution, and one doubts whether the industry as a whole has suffered from it. Piece work was in operation in the building industry for many years before 1939 though it was frowned upon by the operatives as a whole as being a "cut-throat" condition. This however has proved to be a recognised fallacy, and in the early years of World War II, an official publication for Government contracts was issued laying down scheduled rates for various operations and this, unofficially, has become the yardstick of present-day incentive or bonus rates.

In the post-war years the crippling shortage of materials and economic aid for private and public works necessitated licensing, and one can say that the industry is to be complimented on its recovery from such a retardant. It is quite reasonable, however, to suppose that the introduction of bonus earnings has played no small part in this recovery; indeed it can be classed as a major factor.

Let us consider now whether the introduction of such schemes has had a detrimental effect upon the design, quality and standard of workmanship involved. From the design point of view the various architectural bodies and their members have given a new lease of life to the function and appearance of domestic and industrial buildings. True one can hear of older members of the industry reminiscing about the days of good, solid workmanship, but the type of building that is now being designed is not of the same era. New materials, new conceptions of functions, are now studied, unnecessary and unwieldy fittings are obsolete, together with the amount of craftsmanship that was spent upon them; trade operations are far more simple than they were, though the actual standard of good workmanship upon the remaining and new materials is as good as ever. Simplicity in operation and the introduction of labour-saving machinery have been the result of a demand inherent in the design.

The supervisory bodies which to-day carry out the inspection of work are most stringent in their demands for good quality labour, and whilst fully appreciating the employers' difficulties in obtaining good craftsmen, even when operating a bonus scheme, do not accept this as an excuse for shoddy work. Thus the apprentice or trainee, whilst having to work, with due allowances made, with more experienced men, is not misled into believing that sub-standard craftsmanship will suffice as long as his minimum expected output is maintained or even increased. If faulty or defective work is condemned and has to be rebuilt at the operatives' expense the object-lesson is soon learnt; standards of workmanship will always rise to that giving satisfaction to the inspectorate.

Profit-Sharing

The ever-increasing demand for quicker building and increased output by a limited number of men must lead to some form of profit-sharing between employer and employee. Economically the advantages of such incentive schemes are enormous. The building owner pays no more than a very small fraction, if any, of the cost of the system in operation and in return obtains faster progress on the site, the operative is paid by results and insists upon a continuity of work from the foreman and site staff. The employer thus increases his profit margin whilst shortening his contractual period, thereby saving on overheads and on-costs.

This, ultimately, is bound to lead to a reduction in the cost of labour upon building and civil engineering work, and for this reason records of costs of operational labours are computed and recorded for future reference. No amount of basic wage increases will provide the same comprehensive solution as this; they serve only to increase costs.

Incentive schemes and systems of incentive payments are numerous and all workable within their respective spheres. Obviously, however, one could not, for example, successfully operate the same scheme on a housing site as on a factory block, but an intelligent study of the individual characteristics of each contract can ensure that the selected system serves as an almost indispensable factor in reducing costs, speeding building and, indirectly, contributing to the perpetuation of employment in the industry.

SOME USEFUL TIMBERS FOR HEAVY-DUTY FLOORING

By N. C. YORK

"HEAVY-DUTY" flooring may be defined as that laid in factories, warehouses, stores, public assembly rooms, and so on, where the volume of traffic is exceptionally high. Such traffic can be largely pedestrian, as in a big store or dance hall or, in the factory, can consist of wheeled transport.

Both types of traffic have a considerable abrasive effect on timber flooring, even though trucks, and so on, be fitted with pneumatic tyres. Such abrasion results in a disintegration of the surface of the flooring which may well make the whole dangerous, and will certainly cause considerable expense in maintenance.

Abrasion is not the only factor affecting heavy-duty flooring. In factories oil, chemicals, fumes and humidity conditions may all have some destructive effect, and the selection of a timber for such a floor must necessarily take into account the conditions to which it will be exposed.

The common softwood as used for the ordinary dwelling house has a very short life under such conditions, and not all of the numerous hardwood species available are suitable for the purpose. Certain timbers (for example maple and teak) have come to be recognised as "standard" woods for specific flooring purposes, but supplies of these are not as readily available as formerly and their price is correspondingly high. Some of the hardwoods first imported in quantity during the war and post-war years have accordingly been tried for heavy-duty flooring, and notes on some of the more useful of these are given below.

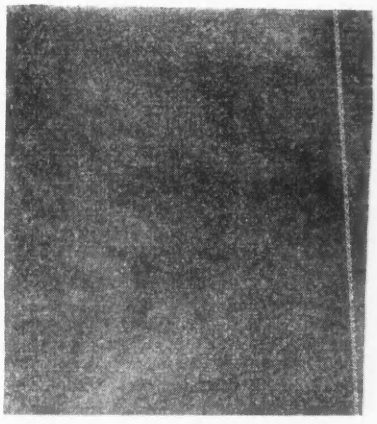
The desirable factors in a heavy-duty flooring timber are, in order of importance, resistance to abrasion, evenness of wear, and strength and stability in service. Colour may or may not be an important consideration, but relative ease or difficulty of working may be comparatively unimportant. Floors subject to special conditions may demand other features in the wood (*e.g.*, resistance to acids, to be capable of taking a high polish, and so on) but in general the foregoing scale of importance will hold good.

For the purposes of comparison the timbers described below have been divided into two colour groups, light and dark. Such a classification is purely arbitrary, and there may even be argument as to the colour group into which a timber should be placed. The notes definitely refer to the heartwood of the species, however, and to timber of good commercial quality. As a rule-of-thumb guide it may be taken that the darker coloured wood of a species will be the stronger and, in a choice between two species, the darker in colour will be the stronger, more durable, and the more suited for heavier work.

Light-coloured Woods

Kwao is a timber of Siam, but precisely the same species is available from India or Burma under the names of haldu and hnaw respectively. This wood is a uniform pale yellow or yellow, darkening only slightly after very prolonged exposure to the air. It is straight-grained and has an average seasoned weight of some 40 lb. to the cubic foot.

This timber is particularly well suited for what might be called the lighter types of heavy-duty flooring where appearance is of some importance, though it is not recommended for purposes where free-



Kwao.

dom from movement is essential, as its stability factors are rather below the average. Some slight borer attack may be found in the species, but it is sufficiently resistant to fungi and has very good working properties. Fine surface cracks are to be expected during seasoning, but these can be eliminated by the subsequent manufacturing processes.

Maple is an exceptionally popular flooring species for assembly rooms, dance halls, and so on. The most commonly used variety is the North American rock maple, but it should be mentioned that lesser-known varieties of true maple (*e.g.*, Japanese, Pacific, etc.) exist that are almost as good, and can well be used in substitution for that variety.

White seraya from North Borneo is not as finely textured as most flooring species, but has its uses for purposes except where exceptionally heavy traffic is to be expected. Although described as white it is really more of a straw colour to very light yellowish-brown. The weight of this timber is about 35 lb. to the cubic foot, and its strength properties are correspondingly lower than those of the denser woods. Shallowly interlocked grain is typical and the wood needs some care in working as it is apt to be rather difficult to cut. For flooring purposes the stock needs careful selection as insect damage is common.

The properties of beech are too well-known to merit description, but this botanical family is limited to the northern hemisphere. From Australia, New Zealand, and so on, come timbers that are so closely related to beech that they might well be described as the southern hemisphere beeches.

One of these, Southland beech, is worth some attention. In colour it somewhat resembles European beech but it shows no figure; the colour is remarkably uniform throughout the wood. The grain is straight and the wood is of about the same density as white seraya.

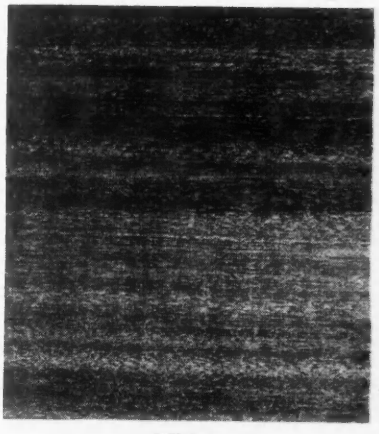
The working properties of Southland beech are quite mild, though it sometimes needs some care in planing to bring it to a good surface. The strength properties are quite good for a timber of its density and while it is not strongly resistant either to decay or insect attack it is sufficiently durable for flooring purposes. Both the seasoning properties and stability factors are good, and distortion in drying is only slight.

It should always be remembered that heavy-duty flooring can be laid very conveniently in the form of wood blocks, which means that tree species that do not provide large timbers can yet be the source of useful flooring material. The species so far described, however, can be used for strip flooring if so desired, and it seems likely that it is in that form that they will be used for purely industrial purposes. Block flooring, eminently suited for more public places, is most likely to be produced from the darker, generally more decorative hardwoods, to which some space must now be devoted.

Dark-coloured Woods

Rhodesian teak is not a genuine teak but is one of the flooring hardwoods that can be quite decorative in appearance. The background colour is brownish when the wood is freshly cut, but it darkens to red or reddish-brown, marked with irregular black lines, flecks or streaks. Density is of the order of 56 lb. to the cubic foot, while the grain may be either straight or shallowly interlocked.

This is a hard and rather strong wood that is somewhat difficult to work. It can be brought to a very good surface, however, that will polish well. For seasoning purposes it is slow drying and may develop slight surface checks, but once dry it continues to hold its shape under very adverse conditions. The timber sometimes shows slight evidence of insect attack but its resistance to decay is high.



Danta.

Also from Africa is danta, a reddish-brown timber of lighter weight than the wood just described, danta weighing 48 lb. to the cubic foot. Durability standards are high and it works readily, though it has a slight tendency to split in nailing that can be troublesome unless the wood is pre-bored. Being interlocked grained it shows a stripe figure when sawn on the quarter, but for flooring purposes flat-sawn stock is probably preferable. Again, the wood is a slow drying one in seasoning, and while not as stable as Rhodesian teak the stability factors are perfectly satisfactory.

Jarrah is one of the best known of the Australian flooring timbers, and the same continent produces a wood very closely related to jarrah and almost indistinguishable from it. The lesser-known species has the title of karri.

Karri is usually straighter in the grain than jarrah, and is red, dark red or reddish-brown in colour, the tone of the wood deepening with age. It is a rather coarse textured wood (coarser than most of the recommended flooring species) but it wears evenly. The weight may be variable from about 56 to 60 lb. to the cubic foot. The strength properties are very high, and it is not an easy wood to work: pre-boring is advisable before nailing. Some care is needed in the seasoning of karri to avoid undue warping or surface checking, and the timber will move rather more freely after manufacture than the average timber if it is not properly seasoned. It is a wood that looks well after being wax polished.

Australian Turpentine

Another Australian species of considerable merit is turpentine, for in addition to its other useful properties the wood shows more than the average resistance to fire. It is not an easy wood to work, being rather gritty, hard on tools, and having an interlocked grain. The average weight, when seasoned, is about 58 lb. to the cubic foot, the wood is closely and evenly textured, and is of a featureless, deep reddish-brown colour.

This is a particularly durable species that is unlikely to show any evidence of past insect attack. The strength properties are extremely high, and although the wood may shrink considerably during seasoning it will hold its place quite well when dry. For comparative ease of working the wood should preferably be cut on the flat though quarter-sawn stock is slightly the more decorative.

Keruing

Keruing is a timber that is closely related to the white seraya previously described, and it therefore shares many of the same characteristics. It is rather variable in weight, but strong and durable. In colour keruing is a rather greyish shade of brown, and has a grain that is variable from straight to moderately deeply interlocked.

As with so many of the imported tropical species, keruing dries only slowly and shrinks considerably while so doing but once seasoned and manufactured it holds its shape well. The working properties of the wood are reasonably good, though they will tend to vary with the hardness and density of the particular sample involved. Keruing cannot be recommended for use where freedom from resins or gum is essential in the wood, and under exceptionally heavy traffic it will tend to wear more easily than most of the species listed below.

Keruing is of Malayan origin and the same country provides balau. This has sometimes been described as Borneo teak, but again it is not a genuine teak.

This timber is a lightish yellow or yellowish-brown when it is first cut, but it soon darkens in colour on exposure to the air: it is sometimes marked with irregular streaks of a greenish tinge, though it cannot be described as a decorative wood. It is extremely heavy and correspondingly strong, is closely and uniformly textured, and has an interlocked grain.

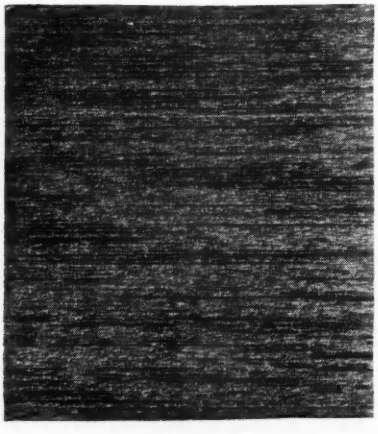
Although rather hard on tools balau works moderately well, and while it does not check or split unduly in drying it tends to warp rather badly: it is about average in regard to stability once it has been seasoned. It is also strongly resistant to all types of wood pest, both fungal and boring, and can be used for flooring where really heavy traffic is to be anticipated.

Although the list of timbers suitable for heavy-duty flooring is by no means inexhaustible, many more species than those described above may safely be used. In conclusion, however, a brief note on greenheart will not be out of place.

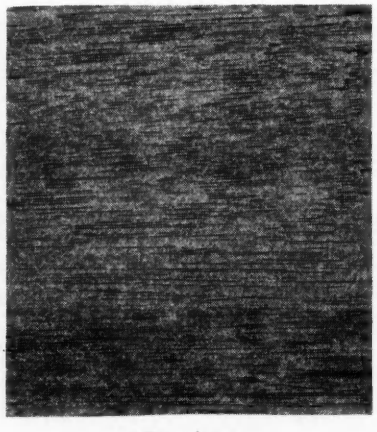
In colour this timber shows a rather wide range of greenish shades, though sometimes the surface is streaked with black or dark brown. The timber has a weight of about 64 lb. to the cubic foot when air seasoned, has a fine, even texture, and a grain that is almost invariably straight.

Pre-boring for nails is advisable, as greenheart has a tendency to split in nailing, especially if the stock is rather thin. As might be expected from a timber of its density it cannot be described as easy to work: its dulling effect on tool edges is noticeable and it is essential that tools be kept sharp to obtain satisfactory results in any operation.

The durability standards are excellent. It seasons slowly with some tendency to check during the process, but holds its shape quite well when manufactured.



Keruing.



Greenheart.

LMBA

Field Marshal Montgomery to Present Medals

FIELD MARSHAL VISCOUNT MONTGOMERY OF ALAMEIN, Deputy Supreme Allied Commander in Europe, is to present the LMBA Medals for 1956. The ceremony will take place in Drapers' Hall on the afternoon of Tuesday, October 30, at 3 p.m. The Lord Mayor, Alderman Cuthbert L. Ackroyd, will preside.

Since their establishment in 1952, when the Duke of Edinburgh made the first presentations in the Mansion House, the LMBA Medals have been presented successively by the Bishop of London, Marshal of the Royal Air Force, Lord Tedder, and the American Ambassador. Each year the Lord Mayor has presided.

Increased Support for City and Guilds

IN RESPONSE to the appeal to industry by the Duke of Edinburgh to support the work of the City and Guilds of London Institute, of which he is president, the LMBA at the May meeting of its council decided to double its annual donation of £250. In future the donation will be £500.

In addition, certain individual members who some three years ago entered into seven-year covenants in favour of the Institute, have agreed to double the amount of their donations.

Duke of Edinburgh's Study Conference

MR. W. K. LAING, senior vice-president of the LMBA, is to represent the building industry at the Duke of Edinburgh's Study Conference at Oxford in July.

RSH Associateship

The Association of Building Technicians' clerks of works diploma examination has been accepted as a qualification for associateship of the Royal Society of Health. Holders of the diploma wishing to apply for associateship may obtain application forms from the Secretary, RSH, 90, Buckingham Palace-road, SW1.

Housing Undergraduates

HOUSING CENTRE DISCUSSION

THE housing of undergraduates during term-time was discussed at the Housing Centre last winter, when the two chief speakers were Mr. Colin A. Cooke, estates bursar of Magdalen College, Oxford, and Dr. Douglas Logan, principal of London University. Mr. W. O. Hart, general manager of Hemel Hempstead Development Corporation, was in the chair.

MR. COOKE said the problem was different at Oxford and Cambridge from that at any other universities where the usual practice was for undergraduates to live in "digs." The essence of housing undergraduates at Oxford and Cambridge was that it was collegiate. Undergraduates were two years in college and one year out of it.

The living accommodation provided at modern universities was termed "Halls of residence." The traditional pattern of Oxford colleges was the staircase system, although women's colleges were built on the corridor system. The staircase system gave a more corporate life for the undergraduates, and brought together a small body of men who grew to know each other from living on the same staircase.

Some of the rooms which had been originally of the proportions of the fourteenth century were divided into "bed-sitters," since generally it was easier to keep one room warm than two. The general pattern in the college, however, was two rooms—a bedroom and a room to work in—for each undergraduate. A central arrangement for bathing, washing, etc., seemed to be more popular than individual bathrooms. From the point of view of labour, this was a great help. The university was not now getting the labour that was once available to run the colleges, owing to the attractions of the motor industry near by.

Mr. Cooke concluded by saying that if a new building was to be erected, he would like it to be far enough away from the existing ones so as to be free of the need to conform to their pattern. He would also like to preserve the staircase system and to build to the pattern of two rooms for each student, with a common room.

Halls of Residence

Setting out the different problems of housing students of modern universities situated in large cities, DR. LOGAN said that newer universities had set themselves against being residential. In a survey made in 1920, it had been found that there were over 20,000 full-time students in the newer universities. Of these, 65 per cent. lived within 30 miles of the universities they attended and only 11 per cent. lived in halls of residence. Last year there had been 47,000 students—only 41 per cent. of whom had homes within 30 miles of their university, with 24 per cent. in residence at the university.

Speaking in favour of halls of residence, Dr. Logan said they provided proper facilities for study. They encouraged students to mix more and so tended to develop the corporate life of the university. They also saved a lot of travelling time. Excluding site value but including furnishing and equipping, the cost of building a hall of residence today worked out at between £1,500 and £2,000 per student place. The greatest financial difficulty in connection with halls of residence however was the cost of running them. Students were in residence for only 30 weeks in the year, but the buildings had to be maintained and kept open for 52 weeks. The only way to cover these costs was by vacation lettings.

He agreed with Mr. Cooke that where money was no object, the staircase planning principle had undoubted advantages, but he was not so sure about the question of bathrooms. With modern universities and particularly in London, where site values were so expensive, Dr. Logan could not see any possibility of adopting the staircase principle. Also, with the need to exploit the site to the utmost, halls of residence would have to be built on the corridor principle.

More and more universities were now turning to the improvement of their "union" facilities so that the students had somewhere where they could obtain late meals and make more use of the library. The hostels which had been set up in various parts of London for students who came from different overseas countries were tending to destroy the intermingling of the various nationalities. In the long run, Dr. Logan thought that converted hostels would be uneconomic as halls of residence, and the only way to provide halls of residence at a charge within the means of the student was to erect properly-designed modern buildings.

PETROL STATIONS AND GREEN BELTS

TCPA's Advice to Warwickshire CC

THE executive committee of the Town and Country Planning Association has sent the following reply to Warwickshire County Council on its request for advice on the problems of planning permission for (a) petrol filling stations in green belt areas, and (b) the erection of new petrol filling stations. The questions are set in italic type and the answers in roman.

(1) *Should there be a special test to be applied to proposed filling-stations in the green belts?*

(1) The Association agree that it is important to restrain the amount of development adjoining main roads running through the green belt. The claims of amenity are higher in the green belt than in many other areas, and local planning authorities would be justified in applying stricter standards of amenity.

(2) *Petrol companies are now applying for planning permission to erect filling stations which are to be used for the sale of their own products only. Is this properly a matter of objection on planning grounds because it tends to lead to a multiplicity of filling stations, whereas filling stations dealing with the commodities of more than one company serve to economise in the use of land and also disturbance to amenity?*

(2) The Association do not consider that planning authorities can object to the erection by petrol companies of stations for the sale of their own products only. But a planning authority is not obliged to give permission to one company merely because it has given permission to another company if it thinks that the erection of more stations would be injurious to amenity. The combined effect of a number of stations may be detrimental to amenity even though each separately might not have had such a detrimental effect as to justify refusal.

Copies of this statement have been sent to all county planning officers, as well as to the Minister of Housing and Local Government. It has also been suggested to the Minister that he should recommend to local planning authorities that they have regard to the terms of the Waleran* Report in determining applications for new petrol stations.

KENSAL "NEW TOWN"

Holford Plan for North Kensington

IN A REPORT to be submitted to the Borough Council on June 5, the Housing and Town Planning Committee of the Royal Borough of Kensington, will seek approval for a long-term scheme, prepared at the Council's request by Sir William Holford, FRIBA, MTPI, in association with Mr. R. T. Kennedy, ARIBA, MTPI, for the redevelopment of the area between Kensal-road, Southam-street, Golborne-road and Adair-road, W10.

The first phase of the scheme would consist of the construction of an eleven-storey block of 42 flats and a four-storey block of 10 maisonettes at sites which are already cleared at Golborne-gardens. This would be followed by two similar buildings at an adjacent site and at a later stage by the redevelopment of the whole of the area south of Golborne-road, leaving the part adjacent to Kensal-road, where most of the industry is located, to be dealt with last. The London County Council is, however, to be asked to approach industrial and commercial firms in the neighbourhood with a view to their relocation.

In preparing the plan, Sir William Holford has had to take into account the probability of delays and difficulties arising from the present scattered industrial and commercial development and has assumed that reconstruction will have to be carried out in stages over a number of years and mainly by means of subsidised public authority housing. The present layout of the streets must also be generally retained in order to avoid heavy capital expenditure in relaying existing services. Nevertheless the proposals aim to change completely the present layout of the buildings and by closing certain streets to vehicles to provide an increased area of paved space for pedestrians and children's play areas free of traffic hazards, a reduction in the number of road junctions and intersections, a reduction of street maintenance costs, and quieter living conditions. The new pattern of building at various heights with four tall point blocks and additional public open spaces will, it is considered, not only let in more light and air than the existing plan, but prove more stimulating architecturally.

Waleran Report. Report of a technical committee under the chairmanship of Lord Waleran, appointed by the Minister of Transport in 1947 to consider and report on (among other things) the technical considerations which should govern the number and distribution of petrol stations.

The Builder

CURRENT PRICES OF MATERIALS

THE information given on these pages has been specially compiled for *The Builder* and is copyright. It is the intention that the details given should indicate fair average prices of materials, not necessarily the highest or the lowest. The prices apply to large quantities of materials loaded at works, delivered at London Stations or at site in London Area as stated. Prices for smaller quantities ex merchant's warehouse will necessarily be higher so as to include the stocking and handling costs involved. Due to the exceptional circumstances now prevailing it is recommended that the prices of materials should be confirmed by inquiry from suppliers and merchants.

AGGREGATES AND SAND

Delivered site in full lorry loads. Average of prices for Boroughs of Westminster, Paddington, Holborn and St. Pancras.

		£	s.	d.
Pit Ballast	per yd.	1	6	0
Pit Sand	,,	1	3	5
Washed Sand	,,	1	6	7
¾ in. Shingle	,,	1	2	11
¾ in. Broken Brick	,,	1	0	6
Pan Breeze	,,		10	9
Fine or Coarse Foamed Slag Aggregate	per ton	3	0	9

2 yds. of fine and 2.6 yds. of coarse per ton.

CEMENT, etc.

Including non-returnable jute sacks or paper bags.

		£	s.	d.
Best British Portland Cement. Standard Specification delivered Charing Cross area.				
6-ton loads and upwards, site	per ton	5	1	6
1 to 6 tons, site	,,	5	13	6
Rapid Hardening Cement in 6-ton loads and upwards to site	,,	5	12	0
1 to 6 tons do. site	,,	6	4	0
Aquacrete Water Repellent Cement. 32s. 6d. per ton on ordinary cement prices.				
Red, Buff or Khaki Colorcrete in 6-ton lots ...	,,	7	18	0
Other colours according to colour.				
In 4-ton lots from 295s. 0d. to 685s. 0d. per ton.				
White Portland Cement	,,	13	2	0
Under 1 ton	per cwt.		15	7
417 Cement (Ultra Rapid Hardening) in 6-ton lots and upwards	per ton	6	14	0
Super Cement (Waterproof), 32s. 6d. per ton above Portland Cement.				
Cullamix Tyrolean Finish, £11 5s. 0d. to £14 0s. 0d. (1-ton loads and upwards).				
Lightning and Ciment Fondu Brands High Aluminous cement, 6-ton lots and up	,,	14	8	3
Stourbridge Fireclay, 6-ton loads at Railway Depot, London	,,	6	12	9
Moler Mortar Powder for Flue Bricks (London sites)	per cwt.	1	10	0

BRICKS

		£	s.	d.
Full Loads.				
First Hard Stocks	per 1,000	11	17	0
Second Hard Stocks	,,	10	16	0
Mild Stocks (Kiln Burnt)	,,	9	1	6
Mild Stocks	,,	8	16	6
All loaded free into lorry at the works. The question of haulage is still very difficult and prices must be obtained from job to job.				
2½ in. Nominal Fletton Bricks to sites in W.C.				
District Commons	,,	5	13	0
Cellular do.	,,	5	13	0
Keyed do.	,,	5	15	0
Rustics	,,	6	18	0
Cellular Rustics	,,	6	18	0
Single Bullnose Commons	,,	6	13	0
Sandfaced	,,	7	13	0
Tuscans	,,	8	8	0
Saxons	,,	8	16	0
Golden Buffs	,,	9	3	0
Best Blue Pressed Staffs (London Stations) ...	,,	27	5	6
Do. Bullnose (London Stations)	,,	27	19	6
Blue Wire Cuts (London Stations)	,,	24	14	0
Midhurst Lime Bricks (London sites)	,,	10	8	0
Uxbridge Whites (London sites)	,,	9	17	0
Special Purpose Sandlime Bricks (London sites) ...	,,	7	14	0
2½ in. Best Stourbridge Fire Bricks (London stations)	,,	27	16	3
3 in. do. (London stations)	,,	33	8	0
2½ in. Moler Flue Bricks (London sites)	,,	36	0	0
2½ in. Machine-made Sandfaced Red Facings (London sites)	,,	14	8	6
2½ in. Machine-made Multi Red Facings (London sites)	,,	14	13	6
2½ in. Hand-made Sandfaced Red Facings (London sites)	,,	15	6	0
2½ in. Hand-made Sandfaced Multi-Colour Facings (London sites)	,,	16	1	0
Hand-made Sandfaced Cherry Red Facings. Berkshire district (London sites)	per 1,000	17	11	3
Hand-made Sandfaced Multi-Colour Facings. Berkshire district (London sites)	,,	17	6	3
Rubber Bricks for gauged arches (London sites) ...	,,	41	10	0
2⅝ in. Surrey Clamp Burnt Multi Stock Facings (London sites)	,,	13	6	0
2⅝ in. Surrey Kiln Burnt Multi Stock Facings (London sites)	,,	14	18	0
Glazed Bricks (London sites), White, Ivory, Brown—				
Stretchers	,,	64	0	0
Headers	,,	63	0	0
Quoins, Bullnose and 4½ in. Flats	,,	80	0	0
Double Stretchers	,,	85	0	0
Double Headers	,,	77	10	0
One side and two ends	,,	87	0	0
Two sides and one end	,,	89	10	0
Splays and Squints	,,	83	0	0

Cream and Buff £3 extra over White. Other colours, hard glaze, £8 10s. 0d. extra over White. All above prices plus 17½% for Best quality and plus 17½% less 10% for Second quality.

PARTITION SLABS, etc.

Delivered Central London Area. (W.C. District).

	Minimum lorry loads.			
Hollow Clay Partition Blocks (Keyed)				
*2 in.	140 yds.	per yd. sup.	4	4
*2½ in.	140 yds.	,,	4	7
*3 in. (3 cavity) ...	120 yds.	,,	5	4
Building Blocks (Keyed)				
*3 in. (6 cavity) ...	110 yds.	,,	5	6
*4 in. (6 cavity) ...	95 yds.	,,	6	9
6 in. (8½ in. × 5½ in.)...	1,250 blocks ...	per 1,000	26	6	0
Clinker Concrete				
2 in.	100 yds.	per yd. sup	3	9
2½ in.	85 yds.	,,	4	4
3 in.	75 yds.	,,	5	3
4 in.	55 yds.	,,	6	5
Cranham				
2 in.		,,	6	8
2½ in.		,,	7	4
3 in.		,,	8	7
4 in.		,,	10	7
4½ in. Load bearing quality		,,	11	8
Moler Partition Blocks				
2 in.	150 yds.	,,	15	6
2½ in.	120 yds.	,,	15	9
3 in.	100 yds.	,,	16	0
4 in.	90 yds.	,,	19	0
Lightweight Concrete Building and Partition Blocks of Various Sources of Manufacture				
2 in.	100 yds.	,,	5	9
2½ in.	80 yds.	,,	6	11
3 in.	65 yds.	,,	8	1
4 in.	50 yds.	,,	9	6
4½ in.	44 yds.	,,	10	2
6 in.	33 yds.	,,	13	8
Thermalite-Ytong Partition Blocks				
2½ in.	120 yds.	,,	6	11
Thermalite-Ytong Loadbearing Insulating Blocks				
3 in.	100 yds.	,,	8	3½
4 in.	75 yds.	,,	10	9
5 in.	60 yds.	,,	13	5
6 in.	50 yds.	,,	16	1½
8½ in.	35 yds.	,,	1	3	0½
Floor Blocks and Filler Tiles				
3 in. Floor Blocks 12 in. by 12 in. delivered in full lorry-loads		per 1,000	33	6	0
4 in. do.		,,	35	14	0
5 in. do.		,,	42	10	0
6 in. do.		,,	47	17	0
7 in. do.		,,	58	8	0
8 in. do.		,,	68	9	0
10″ × 3″ × ⅝″ Filler Tiles in multiples of 10 tiles		per 1,000 multiples	56	15	0
12″ × 3″ × ⅝″ do.	do.	,,	64	10	0
10″ × 4″ × ⅝″ do.	do.	,,	71	0	0

STONEWARE DRAIN PIPES, etc.

The following are the percentages to be added to the Standard List prices delivered London Area.

Delivered ex Merchants Wharf or Depot or Manufacturers Works.

	Over 2 tons	Over 100 pieces Under 2 tons	Under 100 pieces Under 2 tons
Best Quality ...	+85%	+117½%	+130%
BSS Best do. ...	+10% +85%	+10% +117½%	+10% +130%
Tested Quality	+37½% +85%	+37½% +117½%	+37½% +130%
BSS Tested do.	+47½% +85%	+47½% +117½%	+47½% +130%

STONEWARE DRAIN PIPES, etc.—*continued*

		£	s.	d.
3 in.	Land Drain Pipes (in 12 in. lengths) ... per 1,000	11	0	6
4 in.	do. ... ... ,,	14	9	6
6 in.	do. ... ... ,,	29	19	0
9 in.	do. ... ... ,,	57	5	0

DAMP COURSE

Hessian base bitumen 7 lb. per yd. sup. in 24 ft. rolls cut to wall widths in lots of £6 value and over delivered London area ... ... per yd. sup.	3	3½
Asbestos base ditto 7 lb. per yd. sup. do. do. ,,	5	2
Lead lined bitumen ditto 9½ lb. per yd. sup. do. ,,	12	2
18 in. × 9 in. British damp course slates ... ... per 1,000	41	12	8
14 in. × 9 in. do. do. ... ... ,,	32	0	0
9 in. × 9 in. do. do. ... ... ,,	18	2	6
18 in. × 4½ in. do. do. ... ... ,,	19	2	6
14 in. × 4½ in. do. do. ... ... ,,	15	4	9
9 in. × 4½ in. do. do. ... ... ,,	10	5	3

STONE

Bath Stone—			
Monks Park ... ... per ft. cube	8	1½
St. Aldhelm Box Ground ... ... ,,	9	1½
Delivered in railway trucks at South Lambeth B.R. Western Region.			
Doulting Stone Random Blocks. Delivered London area ,,	8	11
Beer Stone. Delivered London area ... ... ,,	8	5
Portland Stone—			
Brown Whitbed in random blocks, 20 ft. average delivered in railway trucks at Nine Elms, B.R. Southern Region ... ... ,,	8	5
Yorkshire Stone—Blue Robin Hood Quality. Delivered to site London in 6-ton lots.			
9 in. × 3 in. Rubbed, weathered, throated and stooled cills ... ... per ft. cube	3	17	9
12 in. × 6 in. do. do. ... ... ,,	2	15	6
12 in. × 3 in. Plain coping, twice throated ... ,,	2	3	0
12 in. × 3 in. Weathered and twice throated coping ,,	2	17	3
14 in. × 6 in. do. do. ... ... ,,	2	11	9
4½ in. × 9 in. Plinth, rubbed on top and face ... ,,	2	6	3
3 in. sawn two sides Slabs, random sizes ... ... per ft. sup.	8	3
Templates and Cover Stones, 3 in., 4 in. and 6 in. thick, edges coped for rendered brickwork ... per ft. cube	1	8	3
Do. do. fair one edge for fair faced brickwork ... ... ,,	1	13	6
Hard York—			
12 in. × 2 in. Square Steps, rubbed on top and edge per ft. run	10	0
14 in. × 3 in. Round-nosed Steps, rubbed on top and front ... ... per ft. cube	2	12	9
12 in. × 6 in. Plain Steps, rubbed top and front ... ,,	2	6	3
2 in. Rubbed and Jointed Paving, given sizes ... per ft. sup.	9	4
2 in. Sawn Paving, edges squared, in random sizes per yd. sup.	3	5	3

TILES AND PANTILES

Delivered London area by road in 6 tons or over per 1,000			
Machine-made Pantiles and French pattern Tiles from Lincolnshire district	29	8	0
Hand-made Pantiles Berkshire district	50	9	0
Hand-made Double Roman Bridgwater district	58	13	6
Hand-made 10½ × 6½ tiles Berkshire district	14	1	6
Machine-made 10½ × 6½ Staffordshire district	13	18	9
Hand-made Hip and Valley tiles per doz.	1	10	0
Machine-made Hip and Valley tiles do.	1	8	0
Concrete tiles 10½ × 6½	8	1	6
do. Interlocking (49S)	19	0	0

NOTE.—Breakage in transit, purchasers' responsibility.

SLATES

First-quality Slates from Penrhyn or Portmadoc, carriage paid in full truck loads to London Rate Station. Per 1,000 actual.			
24 × 12	137	2	4
22 × 12	111	8	0
22 × 11	100	14	1
20 × 12	94	9	10
20 × 10	90	8	6
18 × 10	62	17	0
18 × 9	55	1	6
16 × 10	49	10	0
16 × 8	38	15	3

NOTE.—Breakage in transit, purchasers' responsibility.

TIMBER

Softwood—					
Joinery quality	Ex. Wharf	per standard	£115 to £140
Carcassing quality	do.	,,	£100 to £105
1 in. Tongued and Grooved Flooring	do.	,,	£110	0	0
Hardwood—					
Mahogany—African S.E. ...	do.	per ft. cube	1	10	0
do. Honduras do. ...	do.	,,	3	5	0
Oak European do. ...	do.	,,	2	5	0
do. Japanese do. ...	do.	,,	2	10	0
do. English Logs sawn ...	do.	,,	1	17	6
Teak 8 in. average S.E. ...	do.	,,	3	17	6
Walnut African Logs sawn ...	do.	,,	1	5	0

DOORS (in Lots I-11)

Delivered London area.			
1½ in. 4 Horizontal Panel. Pattern 4 in. deal			
2ft. 0 in. × 6 ft. 6 in. ... ... each	1	12	0
2 ft. 3 in. × 6 ft. 6 in. ... ... ,,	1	13	0
2 ft. 6 in. × 6 ft. 6 in. ... ... ,,	1	14	0
2 ft. 9 in. × 6 ft. 6 in. ... ... ,,	1	16	6
2 in. do. but top panel open. Pattern 4 × G in deal			
2 ft. 6 in. × 6 ft. 6 in. ... ... ,,	2	9	0
2 ft. 9 in. × 6 ft. 6 in. ... ... ,,	2	11	6
2 in. Panel, top panel open. Pattern 2 × G in deal			
2 ft. 6 in. × 6 ft. 6 in. ... ... ,,	2	1	9
2 ft. 9 in. × 6 ft. 6 in. ... ... ,,	2	3	6

SUNDRIES

Delivered London area.			
1 in. Wood Wool Slabs, 6 ft. 0 in. × 2 ft. 0 in. in quantities of 1 ton (89 yds. to 1 ton) ... ... per yd.	5	8
1½ in. do. (67 yds. to 1 ton) ... ... ,,	7	4
2 in. do. (52 yds. to 1 ton) ... ... ,,	8	11½
2½ in. do. (45 yds. to 1 ton) ... ... ,,	10	3
3 in. do. (39 yds. to 1 ton) ... ... ,,	11	5½
Quantities under 1 ton add 1d. per ½ in. of thickness.			
½ in. imported insulation Board, quantities over 5,000 sq. ft. per 100 sq. ft.	2	2	6
⅛ in. Hardboard do. ... ... ,,	2	1	6
⅜ in. do. do. ... ... ,,	3	2	6
½ in. Asbestos Flat Building Sheets ... per yd. sup.	3	8
¼ in. do. ... ... ,,	4	10
Roofing Felt, 1-ply ... ... ,,	1	7
do. 2-ply ... ... ,,	2	0
Best Scotch Glue in slabs ... ... per ½ cwt.	5	0	0
do. pearl ... ... ,,	5	5	0
Croid Glue ... ... 28 lb.	2	6	0
Cut Nails 3 in. (1-ton lots) ... ... per ton	66	10	0
do. 4 in. and up (1-ton lots) ... ... ,,	63	0	0
Wire Nails, 3 in. (4-cwt. lots) ... ... per cwt.	3	0	9
do. 4 in. and up (4-cwt. lots) ... ... ,,	3	0	3

METALS

STEEL JOISTS, ETC.

Basis Joists—			
6 in. × 5 in., 8 in. × 5 in., 8 in. × 6 in., 10 in. × 6 in. 12 in. × 6 in. plain cut to lengths delivered London area ... ... per ton	44	5	0
Extra for sizes			
3 in. × 1½ in. 4 in. × 1¾ in. ... ... ,,	3	10	0
3 in. × 3 in. ... ... ,,	2	10	9
4 in. × 3 in. 10 in. × 4½ in. ... ... ,,	1	10	0
5 in. × 2½ in. 5 in. × 3 in. ... ... ,,	1	15	0
4½ in. × 1½ in. ... ... ,,	3	5	0
5 in. × 4½ in. 7 in. × 3½ in. 13 in. × 5 in. ,,		15	0
6 in. × 3 in. 24 in. × 7½ in. ... ... ,,	2	0	0
6 in. × 4½ in. 7 in. × 4 in. 8 in. × 4 in. } ,,	1	5	0
9 in. × 4 in. 10 in. × 5 in. ... ... }			
12 in. × 5 in. 22 in. × 7 in. ... ... ,,	1	0	0
9 in. × 7 in. 10 in. × 8 in. 12 in. × 8 in. }			
14 in. × 5½ in. 14 in. × 6 in. 14 in. × 8 in. }			
15 in. × 5 in. 15 in. × 6 in. 16 in. × 6 in. } ,,		10	0
16 in. × 8 in. 18 in. × 6 in. 18 in. × 7 in. }			
18 in. × 8 in. 20 in. × 6½ in. 20 in. × 7½ in. }			
Steel angles average price ... ... ,,	46	5	0
Steel tees average price ... ... ,,	47	5	0
Fabricated work delivered London—			
R.S. Joists cut and fitted ... ... ,,	61	7	6
Compound girders ... ... ,,	67	10	0
Stanchions ... ... ,,	72	17	6
Compound stanchions ... ... ,,	77	5	0
In Roof Work—Trusses and Purlins ... ... ,,	90	10	0
Average prices not for awkward work.			
Angle cleats and ⅜ in., ¾ in. and ⅞ in. bolts average price London area ... ... per cwt.	5	3	0

FERRO-CONCRETE BARS

Mild Steel Ferro-Concrete bars British manufacture to BSS785 ex London Stock ⅜ in. diam., and upwards ... ... ,,	44	10	0
¼ in. diam. ... ...per ton extra	8	12	0
5/16 in. do. ... ... ,,	6	12	0
⅜ in. do. ... ... ,,	4	12	0
½ in. do. ... ... ,,	3	2	0

MILD STEEL TUBES

Tubes to BSS1387 and Fittings. List prices and following discounts :

Galvanised Tube—	W.I. Fittings.	Malleable Fittings
Class A + 11¼%		
Class B + 22½%	Light + 38¾%	Malleable List—28¾% + 40%
Class C + 40½%	Heavy + 46½%	
Black—		
Class A — 11¼%		
Class B + 5/4%	Light + 55¼%	Malleable List—28¾%
Class C + 15 %	Heavy + 33 %	

C.I. HALF-ROUND GUTTERS

Delivered London per yd. in 6-ft. lengths

	Gutters	Nozzles	Stop Ends
3 in.	3/7½	3/3	/11
3½ in.	4/1½	3/6	/11
4 in.	5/1	3/11	1/5
4½ in.	5/7	4/5	1/8
5 in.	6/3	4/9	1/11

METALS—*continued*

C.I.O.G. Gutters

	Gutters	Nozzle	Stop Ends
3 in.	4/8	4/3	1/1
3½ in.	5/2½	4/3	1/5
4 in.	5/9½	4/5	1/8
4½ in.	6/3	5/1	1/11
5 in.	6/10	5/9	2/2

C.I. Rain-water Pipes

Per yd. in 6-ft. lengths	Pipe	Bends	Branches
2 in.	7/9	3/11	5/8
2½ in.	7/9	4/5	7/7
3 in.	8/8½	5/6	8/3
3½ in.	9/11	6/6	9/11
4 in.	11/5½	7/11	11/9

L.C.C. Coated Soil Pipes

2 in.	8/9½	6/10	8/3
2½ in.	9/3	7/6	10/3
3 in.	10/5	8/3	12/2
3½ in.	11/7½	10/3	14/3
4 in.	13/3	11/6	16/9

Above prices for gutters, rain-water and soil pipes for under 5 cwt. lots only. Lots over 5 cwt. see List No. 3300 dated February 1, 1955, plus 12½% and tonnage allowance. 4-ton lots 5 per cent., 2-ton lots 2½ per cent.

L.C.C. Coated Drain Pipes

In 9-fts.

	cwt. qr. lb.	per yd.	Bends	Branches
4 in.	1 1 17	30/6	21/3	37/6
6 in.	2 0 1	45/–	56/6	90/9

Asbestos Rain-water Pipes and Fittings

All less 17½ per cent. discount.

	2 in.	2½ in.	3 in.	4 in.
Pipes 6-ft. lengths ... per yd.	3/11½	4/3	5/1½	6/9½
Shoes ... each	2/7	2/10	3/4	4/6
Single Branches ... „	4/–	4/9	5/8	7/11
Bends square or obtuse ... „	2/10	3/1	4/–	5/8
Swan Necks 4½ in. proj. ... „	3/1	4/–	4/6	6/3
do. 6 in. do. ... „	3/4	4/–	5/1	6/9

Asbestos O.G. Gutters and Fittings

	4 in.	4½ in.	5 in.	6 in.
Gutters 6 ft. lengths ... per yd.	3/8½	4/2	4/11½	5/11½
Drop ends ... ... each	3/–	3/6	4/1	4/10
Stop ends ... ... „	–/11	1/–	1/1	1/3
Angles ... ... „	3/1	3/7	4/4	5/1
Nozzles ... ... „	3/–	3/6	4/1	4/10
Union Clips ... ... „	1/6	1/9	2/2	2/6

Asbestos Half-Round Gutters and Fittings

	3 in.	4 in.	4½ in.	5 in.	6 in.
Gutters 6 ft. lengths per yd.	2/7½	3/1½	3/2½	3/9½	5/3½
Drop ends ... ... each	2/2	2/7	2/10	3/1	4/6
Stop ends ... ... „	–/10	/11	1/–	1/1	1/3
Angles	2/6	2/10	3/1	3/4	4/6
Nozzles ... ... „	2/2	2/7	2/10	3/1	4/6
Union Clips ... ... „	1/1	1/2	1/3	1/5	2/1

	Per ton basis in London £ s. d.
Iron—Staffordshire Crown Merchant Quality	43 12 6
Mild Steel Bars	46 18 0
Mild Steel Hoops	42 17 6

	Ex Merchant's Stock per ton Two-ton lots £ s. d.
Soft Sheets C.R. and C.A.—	
20 gauge	56 2 6
24 gauge	58 12 6
26 gauge	61 12 6
Galvanised Corrugated sheets 6 ft. to 9 ft.—	
20 gauge	64 7 0
24 gauge	67 17 0
26 gauge	73 2 0
Galvanised flat sheets C.R. and C.A.—	
20 gauge	65 7 0
24 gauge	68 17 0
26 gauge	74 12 0

ALUMINIUM AND ALUMINIUM ALLOYS

(Base prices)	£ s. d.
Sheet BS 1470 SIC 18 SWG (36 in. wide) ... ... per lb.	2 9½
Sheet BS 1470 NS3 Utility 18 SWG (36 in. wide) ... „	2 7
Coiled strip BS 1470 S1C 18 SWG (24 in. wide) ... „	2 8½
Coiled strip BS 1470 NS 3 Utility 18 SWG (24 in. wide) ... ... „	2 6½
Coiled strip for flashing 99.7% purity 22 SWG (12 in. wide) ... ... „	2 11
Corrugated sheet BS 1470 NS 3 Utility Circular Profile 8 ft. × 32 in. × 20 SWG ... ... per sheet	1 11 0
Corrugated sheet BS 1470 NS 3 Utility Industrial Profile 8 ft. × 31½ in. × 20 SWG ... ... „	1 16 9
Corrugated sheet BS 1470 NS 3 Utility Mansard Profile 8 ft. × 31½ in. × 20 SWG ... ... „	1 10 2
Extruded section BS 1476 E1C simple moulding ... per lb.	2 7½
Extruded section BS 1476 E1C 1 in. diam. round „	2 5
Extruded section BS 1476 HE1WP simple angle „	2 10½
Extruded section BS 1476 HE10WP 1 in. diam. round „	2 9½
Tubing BS 1471 T1C 1½ in. O/D × 20 SWG ... „	4 2½
Tubing BS 1471 HT10WP 1½ in. O/D × 20 SWG „	5 5½

PLUMBERS' BRASS WORK, etc.

Delivered in London area.

All per doz.	M.O.H. ½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
Screwdown bib cocks Crutch head for iron	87/–	128/8				
Toilet bib cocks for iron ...	109/–	158/5				
Screwdown stop cocks for iron	66/–	95/9	188/–	363/–	522/6	917/6
do. with two unions for lead	89/–	132/–	234/4	472/–	623/6	1389/6
Double nut boiler screws ...	18/8	26/5	47/6	48/6	67/–	93/6
Heavy Croydon ball valves ...	77/–	193/6	312/5	568/8	734/10	—
Plumbers' union brass lead to iron	19/6	23/6	38/6	52/10	70/6	165/–
	1¼ in.	1½ in.	2 in.	3 in.	3½ in.	4 in.
Caps and screws	33/–	40/8	59/6	92/5	118/10	155/3
Brass sleeves		31/11	31/11	56/2	74/10	91/5
	1½ × 6 lb.		1½ × 6 lb.	2 × 7 lb.	3 × 7 lb.	
Lead P. trap with brass cleaning screws	70/9		88/6	141/7	241/11	
Lead S. trap do.	85/6		106/3	174/–	312/8	

Solder	s. d.
Plumbers' ... ... per lb.	4 1
Tinmen's ... ... „	4 11
Blow pipe ... ... „	5 0

Copper Tubes and Sheets

Copper tubes BSS 659/1944 on the basic price of 36⅜d. per lb. plus gauge and manufacturing extras as follows. Minimum quantities, 3 cwt.

	Extra d.		d.		d.
⅛ in. × 19 gauge ...	13½	Total per lb.	50½	approx. per ft.	13½
¼ in. × 19 „ ...	11½	„ „	48½	„ „	19
1 in. × 18 „ ...	10½	„ „	47	„ „	29
1¼ in. × 18 „ ...	9½	„ „	46⅝	„ „	35½
1½ in. × 18 „ ...	9½	„ „	46⅝	„ „	42½
2 in. × 17 „ ...	11½	„ „	48	„ „	67½

Rolled Copper sheets up to 48 in. wide, basic price plus gauge and manufacturing extras ... ... per ton	414 15 0

Zinc

Sheet Zinc	10 gauge (25 SWG)	5 cwt. lots upwards per cwt.	8 10 9
do.	12 gauge (23 SWG)	„ „	8 8 3
do.	14 gauge (21 SWG)	„ „	8 7 0

Brass Tubes

Brass tubes basic price, plus gauge and manufacturing extras ... ... per lb.	2 5½

LEAD SHEET AND PIPES

Basis selling price in minimum one-ton delivery to one address in London or Home Counties.

	£ s. d.
Lead Sheet, English, 3½ lb. substance and upwards per ton	149 15 0
Lead Water Pipe in coils ... ... „	151 0 0
Lead Soil Pipe 10 ft. or over 2 in. to 4 in. dia. ... „	152 10 0
„ over 4 in. dia. ... ... „	154 10 0
Lead Gas or Untinned Compo pipe ... ... „	152 10 0

Extras over Basis for quantities under 1 ton	
5 cwt. and under 1 ton ... ... per cwt.	2 0
3 cwt. do. 5 cwt. ... ... „	4 0
1 cwt. do. 3 cwt. ... ... „	6 0

Smaller quantities than 1 cwt. priced specially.

Supplying sheet lead and lead pipe to less than basis weights and cutting to sizes less than basis charged extra according to current trade schedule.

Allowance for Old Lead, collected £100 0s. 0d. per ton weighed at buyer's works.

PLASTER, etc.

Coarse Pink in 1-ton loads and over Delivered on Site per ton	7 11 9
do. White do. do. ... „	7 19 6
Sirapite Coarse do. do. ... „	7 14 0
do. Fine do. do. ... „	8 2 0
Blue Lias Lime in 6-ton loads ... ... „	6 14 6
Hydrated Lime do. ... ... „	5 17 6
Lump Lime do. ... ... „	5 7 0
White Keen's or Parian Cement in 1-ton loads ... „	10 17 0
Pink Keen's or Parian Cement in 1-ton loads ... „	10 11 9
Granite Chips in 6-ton loads ... ... „	2 9 4
Hair ... ... per cwt.	4 17 6
Gypsum Plaster Lath or Base Board ⅜ in. thick 600 yds. and over in one delivery. Delivered site ... per yd.	2 3½
1,200 yds. ... ... „	2 2½
Do. Insulating do. ½ in. thick 600 yds. and over in one delivery. Delivered site ... ... „	2 11½
1,200 yds. ... ... „	2 10½
Gypsum Plaster Wall Boards, 3 and 4 ft. wide, 6 to 12 ft., ⅜ in. thick, 600 yds. and over in one delivery. Delivered site ... ... „	2 6½
1,200 yds. ... ... „	2 5½
Do. Insulating do. ½ in. thick 600 yds. and over in one delivery. Delivered site ... ... „	3 2½
1,200 yds. ... ... „	3 1½

PAINT AND DISTEMPER

Delivered London area		£	s.	d.
Ceiling Distemper	per cwt.	1	7	6
Washable Distemper	,,	5	5	0
Gloss Paint	per gal.	2	10	0
Snowcem cement paint (in 1 cwt. drums)	per cwt.	3	11	0
LEAD PRODUCTS AND OILS				
Ground White Lead, 1 cwt. kegs	per cwt.	9	18	0
Genuine White Lead Paint, 1-19gal. lots in 1 gal. tins	per gal.	3	12	0
Genuine Red Lead, Dry, 1 cwt. keg	per cwt.	7	7	6
Genuine Linseed Oil Putty, 1 cwt. keg	,,	2	18	0
Size XD quality, 28 lb.	per tin		9	0
Raw Linseed Oil (5 gal.) drums extra	per gal.		17	3
Boiled Linseed Oil (5 gal.) do.	,,		17	9
SUNDRIES.				
Turpentine substitute (5 gal.) drums extra	,,		5	6½
do. do. (40 gal.) do. do. ...	,,		4	8½
Solignum, Brown (5 gal. cans) Exterior	,,		7	4
Creosote (40 gal. barrels)	,,		2	0
Paste Powder (1 lb. packets)	per lb.		2	0
White Lining Paper	per piece		1	1

VARNISHES, etc.

Delivered London area		£	s.	d.
Oak Varnish, Outside or Inside	per gal.	1	18	0
Oak Pale Copal do.	,,	1	18	0
Hard Drying Oak for Inside	,,	2	1	0
Crystal Paper Varnish do.	,,	2	4	0
Eggshell Flat Varnish do.	,,	2	6	0
Finest Carriage Varnish	,,	2	5	0
Front Door Varnish	,,	2	1	0
Japan Gold Size	,,	1	14	0
Black Japan	,,	1	15	0
Brunswick Black	,,	1	10	0
Berlin Black	,,	1	7	6
Terebene	,,	1	13	0
Knotting (1 gal. bottles free)...	,,	2	7	0
French and Brush Polish (do.)	,,	2	0	0

GLASS

Delivered London area	per ft. super s. d.
18 oz. Sheet Glass Ordinary Glazing Quality. Cut Sizes	6½
24 oz. ,, ,, ,, ,, ,, ,,	8½
26 oz. ,, ,, ,, ,, ,, ,,	11
32 oz. ,, ,, ,, ,, ,, ,,	1 2½
⅛ in. Rolled Plate	10
⅛ in. and ¼ in. Rough Cast	1 1

	Per ft. super s. d.
⅛ in. Figured Rolled and Cathedral, Standard patterns: White	10
do. Standard Tints	1 5½
do. Special Tints	2 11½
⅛ in. Pinstripe, Hammerstripe, Reeded, Reedlyte and Luminating	1 2
¼ in. Wired Cast	1 3½
¼ in. Georgian Wired Cast	1 3½
Hollow Glass Blocks—	Each
P.B.2. 5¾ × 5¾ × 3⅞ in.	2 11
P.B.3 7⅞ × 7⅞ × 3⅞ in.	4 5
P.B.32 7¾ × 7¾ × 3⅜ in.	4 5
Radiused Corner Blocks to match up with—	
P.B.2	5 6
P.B.3	7 0
P.B.32	7 0
¼ in. Polished Plate Glass, G.G. Quality—	Per ft. super
In plates not exceeding 2 ft. sup.	3 7
,, ,, ,, 5 ft. sup.	4 5
,, ,, ,, 45 ft. sup.	5 1
,, ,, ,, 100 ft. sup.	5 6
¼ in. Polished Plate, extra sizes, *i.e.*, plates exceeding 100 ft. sup. or 160 in. one way or 96 in. both ways. G.G. quality —Not exceeding 135 ft. sup. or 250 in. one way or 135 in. both ways	8 4
Not exceeding 180 ft. sup. or ditto	11 3
Not exceeding 200 ft. sup. or ditto	16 0
Plates exceeding 200 ft. sup. prices on application.	
Substances other than ¼ in. Polished Plate at Special Prices.	

Quantity Tariff—Sheet and Sundry Glass.

The following prices apply to minimum quantities of one size and one pattern delivered by the manufacturer to one site at one time.

Description of Glass	Minimum quantity	Per ft. sup. s. d.
18 oz. sheet O.Q.	3,000	4½
24 oz. ,, ,, ...	2,000	6½
26 oz. ,, ,, ...	2,000	8½
32 oz. ,, ,, ...	2,000	11½
⅛ in. Rolled Plate	1,000	8
⅛ in. Figured Rolled and Cathedral Standard Patterns, White	1,000	8
⅛ in. Pinstripe, Hammerstripe, Reeded, Luminating and Spotlyte...	1,000	11
3/16 in. and ¼ in. Rolled Plate or Rough Cast ...	2,000	11
¼ in. Wired Cast, Hexagonal...	2,000	1 0½
¼ in. Georgian Wired Cast	2,000	1 1

The Builder

CURRENT RATES OF WAGES

AS FROM APRIL 16, 1956. (Every endeavour is made to ensure accuracy but we cannot be responsible for errors.)

KEY TO SCHEDULE OF GRADE RATES.

Grade Classification.	A	A1	A2
Craftsmen	4/3½	4/3	4/2½
Labourers	3/9	3/8½	3/8

Town.	*Grade.*
Aberavon	A
Aberdare	A
Abergavenny	A
Abingdon	A2
Accrington	A
Addlestone	A
Afan Valley	A
Aldeburgh	A1
Aldershot District	A1
Alfreton UD	A
Alnwick UD	A
Altrincham	A
Amble	A
Ambleside	A2
Amersham	A1
Ammanford	A
Andover	A2
Anglesey, Isle of	A2
Ardingly	A2
Arundel	A2
Ascot	A2
Ashbourne RD	A2
Ashbourne UD	A2
Ashby-de-la-Zouch UD	A
Ashby Woulds UD	A
Ashford (Kent)	A2
Ashford (Middlesex)	A
Ashington UD	A
Ashtead	A
Ashton-under-Lyne	A
Aspatria and Brayton	A2
Atherstone RD	A
Attleborough	A2
Axminster	A2
Aylesbury	A2
Aylesham	A2
Bagshot	A2
Bakewell UD	A2
Banbury	A1
Bangor	A2
Barnard Castle UD	A
Barnoldswick UD	A
Barnsley CB	A
Barnstaple	A2
Barrow-in-Furness	A
Barrow-upon-Soar RD (exc. Thrussington A2)	A
Barry	A
Basford RD (exc. Willough-by-on-the-Wolds A1)	A
Basingstoke	A1
Bath	A
Batley MB	A
Baxterley	A1
Beaconsfield District	A
Bearl	A
Beccles	A2
Bedale RD	A
Bedford	A
Bedlington	A
Bedlingtonshire UD	A
Bedwas	A
Beeston & Stapleford UD	A
Belper UD	A
Belton	A
Berkhamsted	A
Berrington	A1
Berwick Borough	A
Beverley MB	A
Bewdley MB	A
Bexhill-on-Sea	A2
Bideford	A2
Biggleswade	A2
Billericay	A
Billing	A
Billingham UD	A
Bilsthorpe	A
Bilston MB	A
Birchington	A2
Birkenhead	*
Birmingham CB	†A
Bishop Auckland UD	A
Bishop's Stortford	A
Bishops Castle MB	A2
Bispham	A
Blackburn	A
Blackpool	A
Blackwell RD	A
Blandford	A2
Blaydon UD	A
Blidworth	A
Blyth B.	A
Bodmin	A2
Bognor Regis	A2
Boldon UD	A
Bolsover UD	A
Bolton	A
Boston MB	A
Bourne End	A
Bournemouth District	A
Brackley MB	A2
Bracknell	A2
Bradford CB	A
Bradford-on-Avon	A2
Braintree	A1
Brandon & Byshottles UD	A
Brecon—Borough of	A1
Breconshire, County of ...	‡A2
Brent Knoll	A2
Brentwood	A
Bridgend	A
Bridlington MB	A
Bridlington RD	A1
Bridgnorth MB	A1
Bridgnorth RD	A2
Bridgwater	A1
Brierfield	A
Brighouse MB	A
Brighton & Hove	A
Bristol District	A
Broadstairs	A2
Bromsgrove UD	A
Broughton, Flint	A
Buckfastleigh	A2
Buckingham	A2
Buckley	A
Bungay	A2
Burnham-on-Crouch	A2
Burnham-on-Sea	A2
Burnley	A
Burton-on-Trent C.B.	A
Bury	A
Bury St. Edmunds	A1
Buxton	A
Byfleet	A1
Caernarvon	A2
Caernarvonshire, Cnty. of	‡A2
Calder Valley	A
Camberley District	A2
Cambridge	A
Cannock UD	A
Canterbury	A2
Cardiff	A
Cardiganshire, County of	‡A2
Carlisle	A

CURRENT RATES OF WAGES—Continued

Town.	Grade.
Carlton UD	A
Carmarthen—Borough of	A1
Carmarthenshire, Cnty of	‡A2
Carnforth	A
Castleford UD	A
Caterham	A
Chapel-en-le-Frith	A
Chard	A2
Charmy Down	A
Chatham District	A
Chatteris	A2
Cheadle (Staffs) RD	A
Chelmsford	A
Cheltenham	A
Chepstow	A1
Chertsey	A
Chester	A
Chester-le-Street UD	A
Chesterfield MB	A
Chesterfield RD	A
Chichester	A2
Chipping Norton	A2
Chipping Sodbury	A2
Chippenham (inc. Chippenham Within and Hardenhuish)	A2
Cirencester	A2
Chorley	A
Clacton	A1
Clay Cross UD	A
Cleethorpes MB	A
Clevedon	A1
Cleveleys	A
Clitheroe	A
Coalville UD	A
Cobham (Surrey)	A
Colchester	A
Colne	A
Colwyn Bay	A1
Congleton	A1
Consett UD	A
Conway	A1
Corby UD	A
Cornwall, County of	‡A2
Corsham District	A
Coventry CB	A
Cranbrook	A2
Cranleigh	A2
Cranwell Aerodrome Site	A1
Crawley	A1
Crewe	A
Crewkerne	A2
Cromer	A1
Crook and Willington UD	A
Crowborough	A2
Cuckfield	A2
Cwmbran	A
Dalton-in-Furness	A
Darlington CB	A
Dartmouth	A2
Darwen	A
Daventry MB	A2
Deal	A2
Denbigh Town	A2
Derby CB	A
Devizes	A2
Devon, County of	‡A2
Dewsbury CB	A
Didcot	A2
Diss	A2
Doncaster CB	A
Dorchester	A2
Dorking	A
Dorset, County of (excepting Poole, Swanage and Wimborne A1)	A2
Dover	A2
Dovercourt	A
Driffield UD	A1
Drigg & Carleton	A
Droitwich MB	A
Dudley CB	A
Dunstable	A
Durham B	A
Eastbourne	A
E. Glam. & Mon. Val.	A
East Grinstead District	A2
East Kesteven RD	A2
East Retford MB	A
Eastwood (Notts) UD	A
Ebbw Vale & District	A
Edenbridge	A2
Ely	A2
Epping	A
Evesham MB	A2
Exeter	A
Exmouth	A2
Fakenham	A2
Falmouth	A2
Fareham	A
Faversham	A2
Felixstowe	A1
Filey UD	A
Fleetwood	A
Flint MB	A
Folkestone	A2
Frinton	A1
Frome	A1
Gainsborough UD	A
Gateshead CB	A
Gillingham (Dorset)	A2
Gillingham (Kent)	A1
Glastonbury & Street	A2
Glossop	A
Gloucester	A
Gloucestershire, Cnty. of	‡A2
Godalming	A2
Goole, MB	A
Goole RD (part—Airmyn, Hook)	A
Gosport	A
Grantham MB	A
Gravesend	A
Grays Thurrock UD Area	A
Great Yarmouth	A
Grimsby CB	A
Grimsby RD (part)	A
Guildford District	A2
Halesowen MB	A
Halifax CB	A
Halstead	A2
Haresfield	A1
Harlow	A
Harpenden	A
Harrogate MB	A
Hartlepool B	A
Harwell	A2
Harwich	A
Haslemere	A2
Hastings	A2
Hatfield (Herts)	A
Havant	A
Haywards Heath	A2
Heanor UD	A
Hemel Hempstead	A
Henley-on-Thames	A2
Hereford	A2
Herefordshire, Cnty. of	‡A2
Herne Bay	A2
Hertford	A
Hexham RD	A
Hexham UD	A
Heysham	A
Heywood	A
Higham Ferrers MB	A
High Wycombe	A
Hinckley UD	A
Hitchin	A
Hoddesdon	A
Holywell	A
Horley	A2
Horncastle UD	A2
Horsham	A2
Horwich	A
Huddersfield CB	A
Hull	A
Hunstanton	A2
Huntingdon (Staffs)	A
Ilkeston MB	A
Ilkley UD	A
Ipswich	A
Isle of Sheppey	A2
Isle of Thanet	A2
Isle of Wight	A2
Ilfracombe	A2
Jarrow B	A
Keighley MB	A
Kendal	A
Kenilworth UD	A
Kettering MB	A
Keynsham	A
Kidderminster MB	A
Kingskerswell	A1
King's Lynn	A1
Kingsteignton	A1
Kirkham	A
Knaresborough UD	A
Knutsford	A
Lancaster	A
Leamington MB	A
Leatherhead	A
Leeds CB	A
Leek UD	A
Leicester CB	A
Leighton Buzzard	A1
Leiston	A2
Leominster	A2
Letchworth	A
Lewes	A2
Lichfield MB	A
Lincoln CB	A
Liskeard	A2
Littlehampton	A2
Liverpool	*
Llandudno	A1
Llanelly (incl. Llanelly RD)	A
Llanfairfechan	A2
Llangollen	A2
London	*
Long Eaton	A
Looe	A2
Loughborough MB	A
Louth MB	A1
Lowestoft	A
Loxton	A2
Ludlow MB	A2
Ludlow RD	A2
Luton	A
Lyme Regis	A2
Lyneham (Devon)	A2
Lytham	A
Macclesfield	A
Maidenhead	A
Maidstone	A
Maldon (Essex)	A1
Maltby UD	A
Malton UD	A2
Malvern UD	A1
Manchester	A
Manningtree	A1
Mansfield MB	A
March	A2
Margate	A2
Market Harborough RD	A1
Market Harborough UD	A
Market Rasen UD	A2
Martock	A2
Maryport	A
Matlock UD	A
Melksham	A2
Melton Mowbray UD	A1
Merionethshire	A2
Merthyr	A
Mexborough UD	A
Middlesbrough CB	A
Middleton	A
Middlewich	A
Mildenhall	A2
Milford Haven UD	A1
Minehead	A2
Monmouth—Borough of	A1
Monmouthshire	A1
Morecambe	A
Moreton Valence	A2
Morley	A
Morpeth B	A
Morpeth RD	A
Mundesley	A2
Nantwich	A
Neath & Valley	A
Nelson	A
Newark MB	A
Newbury	A2
Newcastle-on-Tyne CB	A
Newcastle-under-Lyme	A
New Forest District	A1
Newmarket	A1
Newport, Mon.	A
Newport Pagnell	A2
Newquay	A2
Newton Abbot	A1
Normanton UD	A
Northallerton District	A
Northallerton UD	A
Northampton CB	A
North Shields	A
North Walsham	A2
Northwich	A
Norton Radstock	A1
Norwich	A
Nottingham CB	A
Nuneaton MB	A
Oakham RD	A2
Oakham UD	A2
Okehampton	A2
Oldham	A
Ongar	A
Ormskirk	A
Ossett & Horbury	A
Oswestry	A2
Oundle UD	A2
Oxford	A
Oxted	A1
Padstow	A2
Paignton	A1
Par	A2
Pembrokeshire (except Milford Haven)	A2
Penmaenmawr	A2
Penrith UD	A1
Penzance	A2
Peterborough, Soke of (Eastern Regional portion)	A1
Petersfield	A2
Pickering	A2
Plymouth	A
Pontefract MB	A
Pontypool & District	A
Pontypridd District	A
Porthcawl	A
Portishead	A
Portland Bill	A1
Portsmouth	A
Port Talbot	A
Preston	A
Princetown	A2
Pudsey MB	A
Pulborough	A2
Radnorshire, County of	‡A2
Ramsgate	A2
Raunds UD	A
Rayleigh	A
Reading	A
Redcar B	A
Redditch UD	A
Redhill & Reigate	A
Rhondda Valley	A
Richmond B (Yorks)	A
Ripon MB	A2
Rochdale	A
Rochester	A1
Ross-on-Wye	A2
Rossendale Valley	A
Rotherham CB	A
Royston	A1
Rugby MB	A
Rugeley UD	A1
Rushden UD	A
Saffron Walden	A2
St. Albans	A
St. Austell	A2
St. Helens	A
St. Neots	A2
Salisbury City	A2
Salisbury Plain	A2
Sandy	A2
Sawbridgeworth	A
Saxmundham	A2
Scarborough MB	A
Scunthorpe MB	A
Seaford & Newhaven	A2
Selby UD	A
Sevenoaks	A
Shaftesbury	A2
Sheerness	A2
Sheffield MB	A
Shepton Mallet	A2
Sherborne	A2
Shipley	A
Shoeburyness	A
Shoreham	A
Shrewsbury MB	A
Sirhowy Valleys	A
Sittingbourne	A2
Skegness UD	A1
Skipton UD	A
Sleaford UD	A1
Slough, Windsor & Eton District	A
Smethwick CB	†A
Snettisham	A2
Solihull UD	A
Somerset, County of	‡A2
Southampton and Eastleigh	A
Southend-on-Sea Dist.	A
Southport	A
South Shields CB	A
Southwold	A2
Spalding UD	A1
Stafford MB	A
Staines	A
Stamford MB	A1
Stantonwick	A
Stevenage	A
Stockport	A
Stockton RD	A
Stockton-on-Tees B.	A
Stoke-on-Trent CB	A
Stoke Orchard	A1
Stourbridge MB	A
Stourport UD	A
Stowmarket	A1
Stratford-on-Avon MB	A
Stroud (RD Area)	A1
Sunderland CB	A
Sunningdale	A1
Sutton Coldfield MB	A
Swadlincote UD	A
Swaffham	A2
Swanage District	A1
Swansea	A
Swindon District	A
Swinton UD	A
Tamworth MB	A
Taunton	A2
Tavistock	A2
Tenterden	A2
Teignmouth	A2
Tewkesbury	A1
Thames Haven	A
Thetford	A2
Thirsk RD	A
Thorpe Bay	A
Thurrock UDC Area (North of to Billericay)	A
Tilbury	A
Todmorden MB	A
Tonbridge	A1
Torquay	A1
Totnes	A1
Tring	A2
Trowbridge	A2
Truro	A2
Tunbridge Wells	A1
Tynemouth CB	A
Ulverston	A
Uppingham (Salop)	A1
Uttoxeter RD	A2
Uttoxeter UD	A1
Wakefield CB	A
Wakefield RD	A
Wallsall CB	A
Wallsend B	A
Walsden	A
Walton-on-Naze	A1
Ware	A
Warminster	A2
Warrington	A
Warwick MB	A
Wednesbury MB	A
Wellingborough UD	A
Wellington UD	A
Wellington (Somerset)	A2
Wells (Norfolk)	A2
Wells (Somerset)	A1
Welwyn	A
Welwyn Gar. City	A
West Bromwich CB	A
Westbury	A2
Westcliff-on-Sea	A
Westerham	A1
West Hartlepool CB	A
Westmorland (except Kendal)	A2
Weston-super-Mare	A1
Weybridge	A
Weymouth (including Portland Bill, excluding Portland Stoneyards)	A1
Whitby UD	A1
Whitby RD	A1
Whitehaven	A
Whitley & Monkseaton UD	A
Whitstable and District	A2
Wickford	A
Widnes	A
Wigan	A
Wigton	A2
Wilmslow	A
Wilts. County of	‡A2
Wimborne	A1
Wincanton	A2
Winchester	A1
Windermere	A2
Wisbech	A2
Witham	A1
Withernsea UD	A
Woking	A1
Wokingham	A1
Wolverhampton CB	A
Wolverton District	A1
Woodbridge	A2
Woodhall Spa UD	A
Woodstock	A2
Worcester CB	A
Workington	xA
Worksop MB	A
Worthing	A2
Wrexham (incl. Cefn)	A
Wroughton	A
Wylam	A
Wymondham	A2
Yate	A2
Yeovil Borough	A1
York CB	A
Ystalyfera	A

For Birkenhead, Liverpool and London the rates are:—Craftsmen, 4s. 5d.; Labourers, 3s. 10½d. In the case of London the rate beyond the 12-mile radius is: Craftsmen, 4s. 4½d.; Labourers, 3s. 10d. †Plus 2d. per working day. ‡This is the County rate and applies except where higher grades are stated.

NOTE.—Carpenters and Joiners providing own tools when employed in establishments operating under the Supplementary Rules for Woodworking Factories and Shops, receive 2d. per day; when employed on other building industry work, 4d. per day.

WOMEN'S RATES.—In all districts throughout the country the rate of wages for women engaged in craft processes is 3s. 5d. per hour. Women engaged on work other than craft processes, 3s. 1d. per hour.

For Building Trade Wages in Scotland see page 668

WORKMAN'S FALL INTO TRENCH

Claim for Damages Against Employers Fails

A CLAIM by a Derby workman, Mr. Ralph Forman, of 60, Nevinson-avenue, Littleover, Derby, against his employers, Ley's Malleable Castings Co., Ltd., Derby, and the East Midlands Gas Board, was dismissed by Judge Sir Henry Braund at Derby County Court on April 25.

Mr. Forman claimed £400 damages for injuries he received when he slipped into a trench dug by the East Midlands Gas Board on Ley's factory premises. He suffered a fractured ankle and was away from work for over six weeks.

MR. M. H. GOW, for Mr. Forman, said that Mr. Forman went to work on his motorcycle. After leaving it in the shed provided he had to reach his workshop by going round by the canteen.

When a few days before March 25, 1955, a fence was taken down, Mr. Forman and other employees very naturally used this way as a short cut. A trench was dug where the fence had been and for a time it was covered over with part of the fence supported by planks. This made a nice firm path across the trench and the employees continued to use this short cut.

On March 25, when Mr. Forman used this path to go home for lunch, he found that the covering of the trench had been taken away. He tried to step over but the wall of the trench gave way and he fell in, suffering a fracture to the lower part of his left leg. He was away from work for six and a half weeks.

Mr. Gow submitted that the Gas Board were aware that employees were using that means of access and provided a kind of bridge across the trench which they later removed. They should have foreseen that employees would still go across.

Mr. Gow also submitted that the fact that Ley's provided a longer means of access did not exclude them from keeping both means of access safe. Their duty was to leave the fence up or to give some warning or prohibition sign.

MR. M. HOLDSWORTH, for Ley's, said that Mr. Forman was in a place which was usually fenced off. He submitted that Mr. Forman knew he had no right to be there and that he knew of the danger.

For the Gas Board, MR. E. N. I. JAMES submitted that there was no negligence by the Board. The trench was of no danger to anyone who could reasonably be expected to pass that way. He contended that no warning was necessary.

Judge SIR HENRY BRAUND ruled that the East Midlands Gas Board had constructed a trench in a place which, as far as he could see, they were not bound to expect workmen to use as a passage into the factory. Mr. Forman had taken risks with his eyes open and had known "on his own frank admission" that he was somewhere where he knew he had no right to be. He did not think there was any duty on the Gas Board to defend the trench from being used as a way of passage.

Ley's Malleable Castings Co. maintained a safe way of access by means of another route into the factory. He was satisfied that the firm did not know employees were using the route across the trench and he ruled that there was no obligation upon them to warn employees not to take the short cut.

The plaintiff, saving himself some trouble, unknown to his employers, took the short cut and unfortunately slipped into the trench. He was now holding his employers responsible.

Dismissing the claim against both defendants, Judge Braund awarded costs against Mr. Forman.

ASPHALT AND FELT ROOFING

Joint Statement on Guarantees

A JOINT statement issued by the National Employers Federation of the Mastic Asphalt Industry and the Felt Roofing Contractors Advisory Board says that these two bodies have recognised for some time that it is no longer normal practice in the building industry for specialist trades to issue guarantees, particularly as modern contract conditions in the RIBA and other forms of contract in common use lay down specific requirements as to periods and conditions relating to the defects liability of the specialist contractor.

Long-term guarantees, the statement continues, no doubt served their useful purpose in the asphalt and built-up roofing industries in past days when these materials were untried and unproved, but such a basis for their well-established industries is now considered to be outdated and unnecessary.

The National Employers Federation of the Mastic Asphalt Industry and the Felt Roofing Contractors Advisory Board have therefore decided to reduce the length of guarantee and also to issue a form of guarantee common to both bodies, and announce that as from July 1, 1956, all their members will, on request, issue this guarantee covering a period of 12 months from the practical completion date of the main contract for mastic asphalt or built-up felt roofing, dampcoursing and tanking and asphalt flooring against approved specifications. This one-year period will operate irrespective of the length of maintenance or defects liability period appropriate to the main contract.

Any guarantee already in being will, of course, continue without change.

The statement adds that architects and other customers, from their long experience of these two well-known waterproofing materials, will appreciate that the amended period of guarantee does not in any way represent the true life of the materials.

UNITED STATES LAMINATED TIMBER

OEEC Report

THE European Productivity Agency of OEEC has recently published the report of a Technical Assistance Mission to the United States in 1953 to study the design and manufacture of laminated timber structures.

The technique of laminating wood, the glueing of strips or boards together to form a built-up component, has been used for many years in making furniture, parts of pianos, sports goods and other products, but its application to structures is a development which only began in Europe just before the First World War and in North America in 1935.

In spite of its later adoption in North America, structural lamination is today far more widely employed in the United States and Canada than it is in Europe, where development has, in general, been on a small scale. For this reason the report presents an account in some detail of the manufacturing methods used in the United States, and of factors affecting the design of laminated timber structures.

The report states that the American market for laminated timber was of the order of eight million cubic feet in 1953, and that it is likely that this figure will be found to have trebled in 1955. A large share of the market in churches, schools and halls of all types, in which there is an architectural requirement, is now held by laminated timber. Other important outlets are light curved barn rafters for farm buildings, wide-span beams and arches for industrial buildings and keels and frames for boat building. Some of the larger laminated arches in North America have a span of over 250 feet, while spans of over 100 feet are commonplace.

This report will give a further stimulus to the development of lamination, and will be found to provide much valuable information for the designer and manufacturer.

The report is obtainable, price 10s., from HM Stationery Office.

NEW HANGING PLATFORM

A Swedish Design for Work on High Buildings

A HANGING PLATFORM designed for facilitating plastering and other jobs on very high buildings, the Swedish International Press Bureau reports, has been developed by Mr. A. Lindmark, head of the Alimak-verken AB, of Skelleftea, North Sweden, specialists on machinery for the building industry. The mechanically hoisted platform is raised or lowered by a simple gear lever placed on the platform. The constructors have experimented with similar appliances for five years and much research and testing have preceded the present devices, for which patents are pending. Six different test types have been made.

The platforms are suspended by wires slung over iron girders mounted on the roof. Wires and safety catch straps, one for each wire, are placed at intervals of about four metres (13 ft.) and the platform can be made as narrow or as wide as desired, e.g. from two to 100 metres.

A working load of 0.6 ton per section of 15 ft. is permissible when the platform is at rest. This has proved adequate, as finishing mortar is supplied gradually according to need. When in motion, the platform can support a load of 400 lbs. per section. There are arrangements for full protection against the risks of the load's falling off. One of the advantages of the new system is that traffic can proceed unhindered by the work going on at upper levels, as there is no scaffolding to hinder passage below the work place.

The designers claim that the new platform system, which has been tried out on several buildings up to 23 storeys in height, will also be adaptable for work on silos, church steeples, bridges, ships, factory chimneys, etc. It should also prove useful for cleaning glass façades on large buildings.

NEW COMPANIES

THE FOLLOWING NEW COMPANIES, registered in England, have been announced by Jordan and Sons, Ltd., company registration agents.

Dolphin Development (Argents Farm), Ltd. (563,269) Regd. March 23, 1956. 6, Beatty House, Dolphin-sq., SW1. Bldrs. and contrs. Nom. cap.: £100. Dir.: W. E. Adams, CBE, Mill House, Harlow, Essex.

Robinson & Neville, Ltd. (563286.) Regd. March 23, 1956. 15, Gt. James-st., WC1. Bldrs. Nom. cap.: £1,000. Dir.: D. N. Robinson, 8, Eastwoodbury-la., Southend-on-Sea.

Phelps & Owens, Ltd. (563305.) Regd. March 23, 1956. Priory-rd., Milford Haven. Bldrs. and contrs. Nom. cap.: £10,000. Permt. dir.: W. J. Owens, 11, Nantucket-ave., Milford Haven.

Harold Moore & Son (Builders), Ltd. (563617.) Regd. March 28, 1956. Lobea, Mohuns Park, Whitchurch-rd., Tavistock, Devon. Bldrs. and contrs. Nom. cap.: £3,000. Dir.: H. Moore.

W. H. Collins & Son, Ltd. (563659.) Regd. March 28, 1956. 5, Station-rd., Pangbourne, Berks. Bldrs. Nom. cap.: £2,000. Dir.: W. F. Collins, The Chilterns, Beech-rd., Purley, Reading.

Rawnsley Smith, Ltd. (563642.) Regd. March 28, 1956. 122, South-cres., Prittlewell, Southend, Essex. Bldrs. Nom. cap.: £100. Dir.: Cecelia M. Rawnsley.

Sampson (Charlton), Ltd. (563699.) Regd. March 28, 1956. The Saw Mill, Charlton, Wilts. Bldrs. Nom. cap.: £2,000. Dir.: D. S. Morse, 33, High-st., Malmesbury.

A. C. Crossling, Ltd. (563717.) Regd. March 29, 1956. 82/3, Newborough, Scarborough. Bldrs. and contrs. Nom. cap.: £3,000. Permt. dir.: A. C. G. Crossling, 42, Hillcrest-ave., Scarborough.

J. W. Saunders & Son, Ltd. (563755.) Regd. March 29, 1956. Chorlton, Lacey Green, Aylesbury, Bucks. Bldrs. and contrs. Nom. cap.: £3,000. Dir.: W. J. Saunders.

Pudney & Son, Ltd. (563773.) Regd. March 29, 1956. The Croft, Colne Engaine, Essex. Bldg. contrs. Nom. cap.: £12,000. Permt. dir.: P. H. Pudney.

Sydney Brown, Ltd. (563781.) Regd. March 29, 1956. 82/3, Newborough, Scarborough, Yorks. Bldrs. Nom. cap.: £5,000. Dir.: S. Brown, 173, Falsgrove-rd., Scarborough.

H. Rooke & Son (Cambridge), Ltd. (563838.) Regd. March 29, 1956. 111, King-st., Cambridge. Bldrs. Nom. cap.: £4,000. Dir.: J. Russell, Holly Dene, Milton, Cambs.

S. R. and W. D. Whitemore, Ltd. (563848.) Regd. March 29, 1956. 165, Wollaton Vale, Nottingham. Bldrs. and contrs. Nom. cap.: £10,000. Dir.: S. R. Whitemore.

B. R. Broom, Ltd. (563862.) Regd. April 3, 1956. 52a, Butt-rd., Colchester, Essex. Bldrs. and contrs. Nom. cap.: £6,000. Permt. dirs.: W. C. Colleer, Pownall-house, Pownall-cres., Colchester.

Charles Parker, Ltd. (563985.) Regd. April 4, 1956. 28, St. Ambrose-rd., Cardiff. Bldg. contractors. Nom. cap.: £5,000. Dir.: C. Parker.

Monk Robinson, Ltd. (564029.) Regd. April 4, 1956. 24, Hertford-rd., Edmonton, N.9. Bldrs. Nom. cap.: £100. Dir.: H. W. Robinson, 64, Hermon-hill, Wanstead, E11.

Ray Wayland & Co., Ltd. (564038.) Regd. April 4, 1956. 52/4, Gray's Inn-rd., WC1. Bldrs. Nom. cap.: £100. Dir.: R. D. Wayland, High-st., Sawtry, Hunts.

W. Wright & Sons (Sutton-in-Ashfield), Ltd. (564052.) Regd. April 4, 1956. Redcliffe-st., Sutton-in-Ashfield. Bldrs. Nom. cap.: £5,000. Dir.: W. Wright, Sunshine Lodge, Redcliffe-st., Sutton-in-Ashfield.

PERSONAL COLUMN

MR. J. C. BURMAN, JP, has been appointed vice-chairman of Tarmac, Ltd., 50, Park-street, W1.

MR. M. BURNINGHAM is to retire from his offices as chairman and director of Keith Blackman, Ltd., Mill Mead-road, N17, after 60 years' service with the company. Mr. D. S. Woodley, MIMechE, has been elected to succeed him as chairman.

MR. ALAN WATSON has been appointed technical representative for South Wales for British Plimber, Ltd., 19, Albert Embankment, SE11. His home is at 18, Walter-road, Swansea.

PRESTON BY-PASS

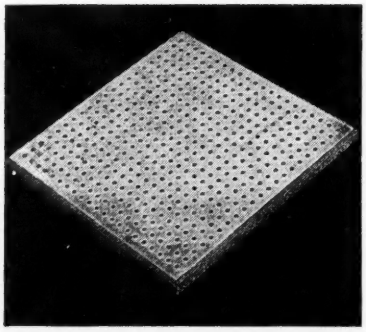
First Length of New Motorway

THE MAJOR PART of the contract, amounting to some £2½ million, for the first section of the proposed new North-South motorway has been awarded by the Lancashire County Council, acting as agents for the Ministry of Transport and Civil Aviation, to Tarmac, Ltd., 50, Park-lane, W1.

The new road, which will be 8½ miles long, will involve 2½ million cu. yds. of excavation and will have an overall width of 112 ft., with dual 24-ft. carriageways and provision in the initial layout for widening to three-lane carriageways when necessary. It will begin south of Bamber Bridge, near the junction of trunk roads A.6 and A.49 and will pass northwards through open country to the east of Preston to join the Preston-Lancaster trunk road just south of the village of Broughton. There will be no crossings of any sort at motorway level and all obstacles will be crossed by bridges of various types of construction, including prestressed concrete. Twenty-one of these bridges are included in the Tarmac contract, and these will be constructed by Leonard Fairclough, Ltd., under sub-contract.

Separate contracts have been placed for the bridge over the river Darwen and the main Preston to Bolton road, A675, at Higher Walton, and for the new Samlesbury bridge over the river Ribble and trunk road A59. The former, 94 ft. wide and consisting of eight parallel plate girders 6 ft. deep and 474 ft. long, continuous over six spans, will be constructed by Dorman Long (Bridge and Engineering), Ltd., the contract price being £193,690.

The scheme has been designed and will be supervised under the direction of Mr. James Drake, BSc, MICE, MIMunE, the Lancashire County Surveyor and Bridgemaster, County Hall, Preston.



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OVERSEAS BUILDING

From Our Own Correspondents

AUSTRALIA.—The British firm of Thomas de la Rue and Co. plans to set up a laminated-plastics factory in Sydney at a cost of £A1m. Work will start within the next three months on a 10-acre site at Hornsby. The architects are Messrs. Stafford, Moore and Farrington, of Sydney, NSW.

**CANADA.*—The UK Trade Commissioner at Winnipeg has advised that the future requirements of The Saskatchewan Power Corporation are likely to be as follows:—(i) A sequence of four 66 M.W. steam-turbo generating sets to be installed between 1961-66. Orders are expected to be placed about 2½ years in advance of installation; (ii) A plan to build a generating station in Winnipeg during the next four years comprising four 66 M.W. In addition to the generating sets the following equipment will also be required: Boiler feed pumps, transformers, switchgear, electrical controls, overhead cranes, coal handling plant, raw water pumps, radial bricks for chimneys and ash handling plant. Firms who require further information on these projects are advised to write direct to the General Manager, The Saskatchewan Power Corporation, Saskatoon, Saskatchewan, Canada, copying initial correspondence to the UK Trade Commissioner at 403 Royal Bank Building, Winnipeg. (Tel: Chancery 4411, Ext. 362; ref. ESB/12267/56.)

HAITI.—The civil authorities of Port-au-Prince have signed a contract with an American firm for the construction of an abattoir worth $2½m. Other projects that are planned include the installation of a 24-in. water pipe from the Diquini springs to Port-au-Prince and the construction of a 200-house "city" for Haitian Army married quarters. . . . Press reports state that the Department of Public Works have for some time been studying the possibility of erecting a wharf 1,500 metres long at Port-au-Prince, beside the existing three-pier shallow-draught wharf, which has a depth alongside of only 28 ft. . . . A report on the project for the international airport near Croix de Bouquets has been submitted by the American engineer who made a study of the matter. So far there is no news of calls for tenders. . . . The loan from the International Bank for Reconstruction and Development for the reconstruction of the main highways is dependent upon an adequate programme of road maintenance being set up which would also be financed by the IBRD. It seems as though road work will be a major part of the building programme for the next few years, at any rate.

NETHERLANDS.—The South Holland Provincial Planalogical Service has suggested the establishment of a harbour and industrial area in the Haringvliet district as soon as the Delta Plan has been completed. The Haringvliet area, the report

* From the Board of Trade Special Register Information Service. The telephone number and extension at the end of the paragraphs relate to the department of the Export Service Branch, Lacon House, Theobalds-road, WC1, where further information can be obtained.

says, offers unprecedented opportunities for the establishment of harbour and industrial installations. Industrial centres, it is proposed, should be formed round three centres: Tiengemeten, Middelharnis and Hellevoetsluis.

NEW ZEALAND.—A contract worth approximately £6m. for the construction of a coal-fired steam-driven electric power station at Mercer, Waikato, North Island, has been let to an organisation formed by Downer and Co., Ltd., Morrison-Knudsen (New Zealand), Ltd., and the Morrison-Knudsen Co., Inc., and H. K. Ferguson and Co., of USA. The station will have a total output of 180,000 kilowatts. . . . The Prime Minister, Mr. Holland, recently introduced the Christchurch Tunnel Bill in the House of Representatives. The proposed tunnel is to be built between Christchurch and Lyttelton. A project of this nature may lead to great developments in the South Island.

**NIGERIA.*—Nigeria's road-building programme may be affected by the starting up of a petroleum company's Colos plant at Apapa. Bitumen will be imported from Trinidad and processed locally. This is the company's fifth plant. A considerable expansion in bitumenised roads is foreseen. . . . A Netherlands firm of engineers has been engaged by the Financial Committee of the House of Representatives to investigate the possible bridging of the Niger. . . . The general manager of the Nigerian Railway Corporation is chairman of a committee to consider claims for railway line extension. . . . Nearly £7m. is devoted to the development of mid-West ports and Bar in the Economic Programme. Of this, nearly £6½m. will be used to dredge the Escravos Bar, and £200,000 for improving Koko, Sapele and Warri ports. . . . The Electricity Corporation of Nigeria will shortly start work on a new diesel power station at Ibadan, and will also make extensions to Kano power station. It will begin work on a new £1m. power station at Aba. (Trafalgar 8855, Ext. 2351. Ref.: CRE 3701/55.)

PHILIPPINES.—The National Economic Council has approved plans for the building of a £400,000 hydro-electric project on the Agusan River in Bukidnon to supply power to Cagayan de Oro City. . . . The Colgate-Palmolive-Peet Company of the Philippines has announced a £200,000 plant expansion programme for this year. . . . The American Wire and Cable Company plans the establishment of a £400,000 plant for the manufacture of wire and cables.

**RHODESIA AND NYASALAND.*—The Division of Roads and Road Traffic, PO Box 8109, Causeway, Salisbury, S. Rhodesia, calls for tenders by June 29 from contractors experienced in bridge construction for a new bridge over the Matetsi River on the Bulawayo-Victoria Falls road. The work comprises approximately 600 cu. yds. of excavation, 1,250 cu. yds. of plain and reinforced concrete, and 260 short tons of structural steelwork. Tender documents from the Commissioner of Roads and Road Traffic at Salisbury on deposit of £10. (Chancery 4411, Ext. 738. Ref.: ESB 12250/56.)

**TRINIDAD.*—Firms interested in submitting details of appropriate plant, equipment, etc., for the $1,150,000 terminal building for Piarco Airport are invited to send separate sets of their literature to (a) the Director of Works and Hydraulics, 1, Edward-street, Port of Spain; and (b) Mr. Carl Agostini, Director of Civil Engineering, 7, Victoria-avenue, Port of Spain. (Chancery 4411, Ext. 776. Ref.: ESB 13052/56.)

An American Tour

Mr. I. J. O'Hea, chairman and managing director of Colt Ventilation Ltd., and W. H. Colt (London) Ltd., is on his way home after a successful two months' tour of the principal cities of the United States and Canada. In addition to visiting Colt's subsidiary company in Toronto, Mr. O'Hea has been finalising the formation of their new American company in Los Angeles, California, which is to be known as Colt Ventilation of America Inc.

Space in Canadian Factories

The UK Trade Commissioners in Canada are sometimes approached by Canadian firms having spare production or storage capacity which they are willing to offer to UK manufacturers. In some instances the Canadian firm may also be able to enter into an arrangement which enables British firms to use established distribution and sales facilities in Canada. In future, states the Export Services Branch, BoT, Special Register circulars about individual cases will be sent to subscribers who have indicated their interest in the Canadian market and who are known to make products suitable for the particular requirements of the Canadian inquirer. (Trafalgar 8855, Ext. 2626, CRE/12278/55.)

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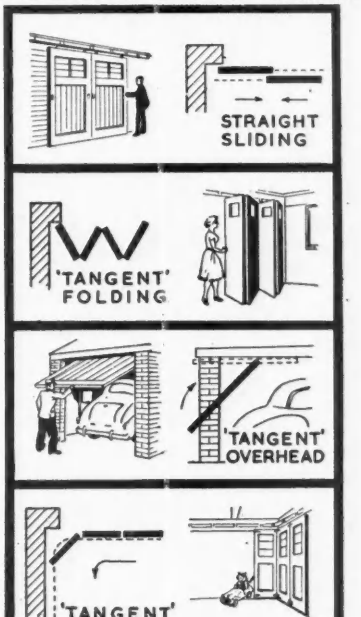

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The SCOTTISH BUILDER

NEW HOUSING IN SCOTLAND

Design and Layout Criticised by Department of Health

THE Scottish nation's health continued to improve in 1955, according to the annual report of the Department of Health for Scotland, now published (HMSO, price 5s.). Published along with the Department of Health report is the report of the Scottish Health Services Council and the Standing Advisory Committees. Among the topics reviewed were doctors' houses in the Highlands and Islands, and research undertaken by local authorities.

A section of the report is devoted to housing. It says that the number of new houses completed was 33,669, the third highest total on record. Seventy-three local authorities out of 230 had no houses under construction at the end of the year, almost all being rural counties or small burghs in the rural areas at or approaching the end of their programme, and this partly accounted for the drop in completions from the record totals of 1953 and 1954.

The housing problem in Scotland was becoming localised: in some parts of the industrial belt great need still existed, and there was no slackening of effort by local authorities in these areas.

A survey showed that while the standard of workmanship in the finishing trades in housing was "reasonably sound," the finishing was sometimes relied upon to make good unsatisfactory work at the earlier stages, particularly inferior brickwork.

Commenting on the standard of layout and design it remarks that "with some outstanding exceptions it falls short of what is desirable and is now often achieved elsewhere."

"The disappointing appearances of some of the schemes can hardly be attributed to economy measures; indeed some points of detailed design which could be criticised are the result of unnecessary expenditure; this is true also of the elaborate road patterns which spoil many schemes."

"A poor standard of layout is even more serious than poor house design . . . schemes which consist of nothing but long rows of houses on either sides of street roads are drably uniform and depressing, no matter how good the design of individual blocks may be."

"There was a disturbing failure to make any systematic provision for open space . . . where open spaces were provided they were generally laid out in too elaborate a fashion, e.g., ornamental flower beds."

"Very few suitably equipped play areas for children of different age groups were found; play areas need not be costly, but not one out of 60 sites visited in the west of Scotland had any provision of this kind. The children seemed to have nowhere to play near their homes but on the streets."

Rents Below England

Net rents of council houses in Scotland, i.e., rent excluding owners' rates, ranged from an average of 3s. a week in Armadale to about 14s. 4d. a week in Lauder. In Glasgow the average net rent was about 5s. 10½d. a week. In Edinburgh it was about 9s. 11d. a week.

Comparison with sample areas in Northern Ireland and England and Wales shows that in these countries the average council house rent is almost twice as high as in Scotland.

Town and Country Planning

Local planning authorities continued to make good progress in the preparation of development plans. By the end of the year, 44 development plans, part plans, or amendment proposals, had been submitted to the Secretary of State by 34 of the 57 local planning authorities in Scotland. Approval had been given to 24 plans and proposals from 21 different authorities.

At East Kilbride 3,657 new houses were completed, and the population was 14,500 by the end of the year. At Glenrothes, 270 houses were built in 1955 compared with 346 in 1954 and 434 in 1953. The population at the end of the year was 6,600.

Grangemouth Development

PLANS for new buildings costing an estimated £460,000 for the development of Grangemouth petroleum chemical industry were approved at Grangemouth Dean of Guild Court on May 22. Twenty different structures at the premises of British Hydrocarbon Chemicals, Ltd., at Bo'ness-road, are involved. The company was also granted permission to build an 84-feet-long steel tunnel in Bo'ness road to take service facilities from the present works across to Grangemouth Air Field, which is being industrially developed.

NEW BUILDINGS

Aberdeen.—Plans in hand for extensions and modernisation of the Academy at est. cost ££230,000. City A: George M. Keith, AMTPI, FRIAS (A), Broad-st., Aberdeen.

Arbroath.—Plans in hand for scheme of new houses at Kinnaird-st. site. Council A: Master of Works Offices, Arbroath, Angus.

Ayr.—Plans approved for additions and alterations at County Buildings. County A: Robert G. Lindsay (F), County-bldgs., Ayr.

Ayr.—Plans approved for third development of Hillfoot-rd. housing site. £102,750 est. Burgh A: Thomas O'Beirne, MIMunE, MIWE (A), Municipal-bldgs, Ayr.

Bridge-of-Allan.—New scheme of 20 houses is planned at Castleview Drive development.

Edinburgh.—North British Rubber Co., Ltd., plans, during next three years, to demolish and rebuild with one-storey structure 145,000 sq. ft. in area, roughly one-third of Castle Mills, to west of Viewforth. £3m. est.

Edinburgh.—Plans approved for dog and cat home at Marine Gardens, Portobello, for Edinburgh & East of Scotland College of Agriculture, Broughton-rd., Westend, Edinburgh. £40,000 est.

Falkirk.—Plans in hands of own architects for scheme of reconstruction and additions at Newmarket-st., for South of Scotland Electricity Board.

Glasgow.—Plans prepared for A. E. Barr & Co., Ltd., 1208, Gallowgate, for additions and alterations at their works. A: Magnus Duncan, 243, Eglinton-st., Glasgow, C5.

Glasgow.—Now scheme of 26 houses to be erected at Eldon-st., Westend. Plans by Robert L. Rankin, AMTPI, AMInstCE, Planning & Architectural Dept., Wallace-sq., Greenock.

Glasgow.—Plans prepared for Bryant & May, Ltd., Shuna-st., for additions and alterations at Empire Works. A: Frank Burnet & Boston & James Bell (F/F), 180, Hope-st., Glasgow, WC2.

Greenock.—Plans prepared for 26 houses in 11 blocks at Eastleigh. A: Robert L. Rankin AMTPI, AMInstCE, Municipal-bldgs., Wallace-sq., Greenock.

Inverness.—Plans in hand for new Corporation Slaughterhouse. Council A.

Kirkcaldy.—Plans approved for 23 houses, offices and garage at Miltonhall housing development site. Council A.

Kirkcudbrightshire.—Plans in hand for extension to Academy at Kirkcudbright. County A: A. T. Caldwell (L), County Offices, Kircudbright.

Lanarkshire.—New buildings for National Coal Board, to be erected at Auchdrennon Mains, also extensions to building at Douglas Castle Colliery, Lesmahagow. Board's own A.

Montrose.—Angus CC to build 24 houses at 4-acre site at Hillside recreation park.

SCOTTISH BUILDING TRADE WAGES

FOLLOWING are rates of wages authorised by the Scottish National Joint Council as from April 16, 1956. They apply to the whole of Scotland, including the islands of Orkney, Shetland, etc.

Grade A: Craftsmen, 4s. 3½d.; Labourers 3s. 9d.

For apprentices, the rates are :

Year.	Percentage of Craftsman's rate.	Per week of 44 hours.
		s. d.
1st	25	47 2½
2nd	33½	62 14½
3rd	50	94 5
4th	66⅔	125 10½
5th	75	141 7½

For female labour, the rates are :

	s.	d.
Operatives on craft operations (at end of probationary period)	3	9
Operatives on labouring operations (at end of probationary period)	3	5½

The Builder FUTURE CONSTRUCTION

Full details of Public Appointments open will be found in the Advertisement pages of this and previous issues.

CONTRACTS OPEN

For some contracts still open but not included in this list see previous issues. Those with an asterisk are advertised in this number. The dates at the heads of paragraphs are those for the submission of tenders; a dagger (†) denotes closing date for applications; the name and address at the end refer to the person from whom particulars may be obtained.

BUILDING

JUNE 1.

***†Great Yarmouth CB.**—64 maisonettes, George-st., and 36 flats and 58 houses, Magdalen College estate. BE. Dep. £2 2s. Tenders by June 28.

JUNE 4.

†Southampton CBC.—Police hostel at 12/18, Hulse-rd. Boro' A. Tenders by July 5.

JUNE 6.

***†Birmingham City C.**—88 flats, "Melville Court," Melville-rd., Edgbaston. City A. Dep. £2 2s. Tenders by July 11.

***†Market Harborough UDC.**—Six shops and six maisonettes, Southern estate, and 13 garages, etc. Gotch, Saunders & Surridge, architects, Bank-chbrs., Kettering. Dep. £3 3s.

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JUNE 7.

***†East Suffolk CC.**—Flat at Halesworth Police Station and police house at Woodbridge. County A, Ipswich. Dep. £2 2s. each. Tenders by July 3.

JUNE 9.

***Golborne UDC.**—Roof tiling to 18 dwellings, Lowton-rd. site, and 12 dwellings, Laburnum-rd. site. E&S.

JUNE 13.

***†Chislehurst and Sidcup UDC.**—New roof to Council Offices. E&S.

JUNE 15.

***†Northampton CB.**—Clearance and levelling of land adjoining Spring-la. school. H. A. Skerrett, Chief Education Officer. Dep. £2 2s.

JUNE 16.

***†Bromley BC.**—28 old people's bungalows, Springfield-rd. BE. Dep. £2 2s.

JUNE 18.

***†Barnet UDC.**—Applications invited from firms for inclusion on selected tender list for 263 dwellings at Whitings Hill estate, section 3. E&S. Ravenscroft House, Wood-st.

***Horsham UDC.**—30 houses, Needles Farm estate. E&S. Dep. £2 2s.

***Luton BC.**—Granolithic flooring and thermoplastic tile flooring to 186 houses, Vauxhall Park estate, and 415 houses, Runfold estate. Boro' A. Dep. £2 2s.

JUNE 22.

***Bebington BC.**—112 dwellings, Mill Park estate, Eastham. BE&S. Dep. £3 3s.

***Ealing BC.**—36 flats, Fairview estate, Northolt. BS. Dep. £2.

***Ealing BC.**—Twenty-seven flats, Lime Trees estate, Northolt.. BS. Dep. £2.

JUNE 25.

***St. Albans City C.**—Conversion of shop into 2 shops, and internal work to properties in High Oaks. City E&S. Dep. £2 2s.

JUNE 26.

***Carlisle City C.**—52 flats, 2 bungalows and 2 houses. City S, 18, Fisher-st.

***†Greenwich BC.**—Converting 26, Kidbrooke-grove, Blackheath, SE3, into six flats. BE&S.

JUNE 27.

Manchester City C.—Combined clinic at Northern Moor. City A.

JUNE 28.

***Reading CB.**—Two pairs of houses and one block of six aged persons' bungalows at "Parkhurst," Bath-rd. Boro' A. Dep. £2 2s.

JULY 2.

***Lincoln (Kesteven) CC.**—Pair of staff houses at Kesteven Farm Institute, Caythorpe. County A, Sleaford.

***Lincoln (Kesteven) CC.**—Building work, Stubton Hall Boarding Special School. County A, Sleaford.

*North Riding EC.—Erection of Wensleydale County mod. sch. at Leyburn. W. B. Edwards & Ptnrs., architects, 5/6, Claremont-bldgs., Eldon-pl., Newcastle-on-Tyne, 1.

JULY 3.

*Croydon CB.—Converting 2 houses in Sydenham-rd. into 16 units of living accommodation for blind people. BE.

JULY 5.

*Rowley Regis BC.—100 houses, Tividale Hall estate. A: Municipal-bldgs. Dep. £3 3s.

JULY 16.

Government of Canada.—Erection, completion and demolition of Canadian Pavilion, Brussels Universal and International Exhibition, 1958. Representative, Canadian Government Exhibition Commission, 180, Piccadilly, W1. Dep. 200 dollars.

PAINTING, MATERIALS, ETC.

JUNE 15.

Worcester City C.—Interior and/or exterior painting at 11 schools during summer holidays. City E&S. Dep. £2 2s.

*Worcester City C.—Redecoration of 11 school buildings. City E&S, 22, Bridge-st. Dep. £2 2s.

JUNE 18.

*Kingston-upon-Thames BC.—External redecorations to 113 houses and 79 flats at Norbition, Kingston and Chessington. BS. Dep. £2 2s.

*Rugby BC.—External painting of Overslade Hostel. BS. Dep. £2 2s.

JUNE 20.

*Middleton BC.—Aluminium alloy chain link fencing and fittings. Boro' A.

MUNICIPAL AND CIVIL ENGINEERING WORKS, ETC.

JUNE 9.

Eccles BC.—Paving and making-up of Blandford-rd., Slater-st. and part of Campbell-rd. Boro' E.

JUNE 11.

Lancashire CC.—Widening of Bridge-st. and Dale-st., A.640, from Golden Fleece Hotel to Chapel Gate, Milnrow. County S., Preston. Dep. £5.

JUNE 12.

Inverness CC.—Six miles 3-in. and 2-in. asbestos-cement piping, with necessary specials, etc., and construction of pumphouse, 10,000 gall. r.c. concrete tank and 20,000 gall. per day r.c. filter on the island of Bernera, Harris. County C.

JUNE 13.

Huntingdon RDC.—450 yds. 4-in. dia and 725 yds. 3-in. dia. asbestos-cement pipes with flexible joints, at Brampton. Pick, Everard, Keay & Gimson, constg. engrs., 6, Millstone-la., Leicester. Dep. £2 2s.

Huntingdon RDC.—One mile 8-in. dia. spun-iron pipes with flexible joints, at Abbots Ripton. Pick, Everard, Keay & Gimson, constg. engrs., 6, Millstone-la., Leicester. Dep. £2 2s.

Stoke-on-Trent City C.—(1) Construction of two access bridges, comprising mass concrete abutments and steel and concrete decking, over Bucknall/Adderley Green branch railway at Berry Hill Neighbourhood unit. (2) Northern approach road to Bentilee and Ubberley estates, comprising 4,250 sq. yds. dual carriageway, with roundabout, footways, SW drainage, etc. (3) Reconstruction of 290 lin. yds. 12-in. to 21-in. dia. sewer at St. John's-sq. and Market Place, and 260 lin. yds. 9-in. to 15-in. dia. sewer at Greenhead-st. City E&S. Dep. £3 each contract.

JUNE 14.

Orpington UDC.—5,100 sq. yds. concrete carriageway, 270 lin. yds. 6-in. and 9-in. foul water sewer and ancillary works, at Ramsden housing estate. E&S. Dep. £2.

JUNE 15.

Batley BC.—Reconstruction and surfacing with dense tar and precoated chippings of Liverpool/Leeds/Hull trunk road, A.62, for 360 yds. westward from Morley boundary to railway viaduct. Boro' E. Dep. £2.

Kidderminster BC.—(a) 3,000 lin. yds. precast concrete kerbing; (b) resurfacing 16,000 sq. yds. footpaths and 7,000 sq. yds. carriageway on various roads. Boro' S.

JUNE 16.

Cambridgeshire CC.—Widening of Hauxton Mill bridge over River Cam on Cambridge/Royston road, half-a-mile from Cambridge City boundary. Bridge is to be widened on east side by 23 ft. at one end and 29 ft. at the other, by means of three r.c. segmental arches of 18 ft. 9 in. span and 4 ft. 6 in. rise. The existing structure is to be opened for inspection and any strengthening works to be carried out as ordered. County S.

JUNE 18.

Barnes BC.—Resurfacing of carriageway of Upper Richmond-rd. West between Priests Bridge and Milton-rd. with bitumen macadam, construction of four r.c. bus stopping places, certain preparatory works and foundation repairs. Approx. area of surfacing 10,000 sq. yds. Boro' E&S.

†Barnsley CBC.—Applications for inclusion in approved list of civil engineering contractors in connection with Lundwood sewage works reconstruction (to treat DWF of three million galls. a day) and Athersley trunk sewer (2¼ miles of 15-in. to 30-in. precast concrete tube, 720 yds. in heading). Boro' E&S.

JUNE 19.

Carlton UDC.—(1) 459 lin. yds. 15-in. dia. sewer in heading and open cut. (2) 888 lin. yds. 15-in. dia. sewer in open cut. E&S. Dep. £2 2s.

JUNE 21.

States of Jersey.—1,400 lin. yds. 9-in. to 30-in. dia. sewers at depths of 6 ft. to 20 ft. in varying subsoils. S. Averill Gothard, BSc., MICE, Public Health Offices, South Hill, St. Helier. Dep. £5.

JUNE 22.

Launceston RDC.—1,400 lin. yds. 6-in. dia. glazed stoneware pipe sewers, 80 lin. yds. 4-in. dia. rising main, ejector station, sewage disposal works, etc. A. H. S. Waters & Ptnrs., engrs., 25, Temple-row, Birmingham, 2. Dep. £5 5s.

Tonbridge UDC.—1,600 yds. hardcore roads, including formation excavation, kerbs, channels and SW drainage, and provision of foul and SW drainage to 290 houses at Higham Wood estate. E&S. Dep. £2 2s.

JUNE 30.

Blaby RDC.—1,400 lin. yds. 6-in. dia. spun-iron pipes with flexible joints and sewage pumping station at Whetstone. Pick, Everard, Keay & Gimson, constg. engrs., 6, Millstone-la., Leicester. Dep. £3 3s.

Fulwood UDC.—5,931 lin. yds. 24-in. to 9-in. dia. sewers, manholes, storm overflows and ancillary works at Broughton. E&S. Dep. £5 5s.

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GENERAL BUILDING WORK

(LONDON)

Acton. — SCHOOL CONVERSION.—Middlesex Education Com. has approved in principle the reorganisation of Acton county boys' gram. sch. as a mixed gram. sch. for 720 pupils, and tenders are to be invited for the first instalment, which will include three new classrooms, estimated to cost £11,262. Area A: E. Seel (F), 1, Queen Anne's-gate-bldgs., SW1.

Brentford and Chiswick.—SCHOOL EXTENSION.—Middlesex CC is to purchase the site of the former St. Paul's Vicarage, St. Paul's-rd., Brentford, for extensions to Brentford sec. mod. school. Area A: G. Anderson (A), County Architects' Dept., 1, Queen Anne's-gate-bldgs., SW1.

Ealing.—SITES FOR SCHOOLS.—Middlesex CC has approved the purchase from the BC of five sites for new prim. schools at Northolt Park estate. County A: G. C. Stillman (F), 1, Queen Anne's-gate-bldgs., SW1.

Edmonton.—SCHOOL EXTENSION.—With the purchase of two small remaining plots at Doncaster-rd., the Middlesex CC will acquire all the land needed for the proposed extension to Houndsfield-rd. school.

Erith, Kent.—The LCC is to extend the southern outfall works at Crossness, by the construction of a new sewage treatment works to deal with the whole of the flow from the southern drainage area. The total estimated cost of the work is £9¾ million, of which £150,000 will be incurred in the current year and the remainder spread over the period 1957-1964. Chief Engineer, County Hall, SE1.

Harrow. — REDEVELOPMENT. — An outline scheme for the comprehensive redevelopment of the 14-acre "Poet's Corner" site, near Harrow and Wealdstone station, by shops, houses and a civic centre, has been submitted to MoH and LG and an early decision has been promised. The Middlesex CC has agreed, in principle, to participate in the scheme, on condition that county offices are provided in a separate block within the precincts of the Civic Centre. Boro' E&S: J. H. Melville Richards, AMICE, MIMunE, AMIStructE, Cottesmore, Uxbridge-rd., Stanmore.

Hornchurch.—SHOPS AND MAISONETTES.—TP approval to H. Ferdinando for seven shops with maisonettes over at junction of Elm Park-ave. and Dibban-ave., Elm Park.

Hornchurch.—PUBLIC HOUSE.—Amended site and drainage plan for new public house at Front-la., Cranham, for Charrington and Co., Ltd., approved for by-law and TP purposes.

Hornchurch.—HOUSES.—By-law approval to Parrish (Builders), Ltd., for six dwelling houses at new street off Edison-ave. TP approval already granted.

Wood Green.—HOUSING SITES.—BC hopes to purchase a site at Letchworth for 86 dwellings and 235, Victoria-rd., Alexandra Park, for erection of three maisonettes and three flats. Boro' E&S, Town Hall, N22.

(PROVINCIAL)

Barnard Castle.—RDC A, J. Lawton (A), has prepared plans for 24 flats at Evenwood and 24 at Cockfield. Tenders being obtained.

Birkenhead.—BC to prepare plans for proposed Overchurch prim. sch. Plans submitted to BC:—15 houses at Ford-rd., Wroxham-drive and Salacre-la. for Briscoe (Builders), Ltd., West Derby; 12 bungalows at Girtrell-rd. for Morris & Jones, Ltd.; shops with living accommodation at Woodchurch-rd. for Berties, Ltd., 7, Victoria-st., Liverpool (A: Edmund Kirby & Sons (A), 5, Cook-st., Liverpool); extension to offices at New Chester-rd. for Cammell Laird & Co., Ltd., licensed premises at Woodchurch Estate for West Cheshire Brewery Co., Ltd., (A: Rees & Holt (A), 64, Rodney-st., Liverpool).

Blackpool.—BC to invite tender for extensions at Highfield sec. sch.—Plans submitted to BC:—14 bungalows at Shore-rd. and Norbreck-rd. for R. Fielding & Son, Ltd.; 16 houses at Devonshire-rd. for Matthews & Turner, Ltd.; 142 houses and 174 bungalows at Luton-rd. and Neville-ave. for Sir Lindsay Parkinson & Co., Ltd., London; 10 bungalows and 2 houses at Vicarage-la. and Whittam-ave. for F. Turner, 18, Vicarage-la.

Bootle.—BC proposes 8 one-bedroomed flats at Captains-la. nr. Ford station.

Bradford.—TC to prepare plans for new occupation centre, £45,000 est.

Chester-le-Street.—UDC to build 137 houses with roads and sewers at West-la. S: W. Ridley.

Coventry.—Planning and Redevelopment Com. propose development of Smithford-way as shopping precinct for pedestrians only, with canopies crossing The Precinct, £44,650 est.

Dewsbury.—EC appointed Holdsworth, Son & Ptnrs., 75, Bower-rd., Sheffield, as QS for new jun. sch. at Chickenley.—BC proposes erection of 8 houses at Grange-rd. Private A to be appointed.—BC to invite tenders for 125 dwellings and 2 shops at Old-la. site.

Durham.—Miners' Welfare Dept., N.C.B., Gosforth, Newcastle, are preparing plans for four standard pit-head baths, two extensions and two short-life baths, two medical centres and two canteens.

Durham.—J. Bates, 152, Front-st., Chester-le-Street, has been appointed QS by CC for Felling Lingey-hse. infants' and jun. schs., Felling Roman-rd. infants' and jun. schs., and additions to Spennymoor Durham-rd. mod. sch.

Eccles.—TC approved plans:—extensions to Enterprise Works, Clifford-st. for Regent Tyre & Rubber Co., Ltd., and new metallurgical block at Vulcan Works, Green-la. for Mitchell, Shackleton & Co., Ltd. A: Thorpe & Smith, 65, Barton-arcade, Deansgate, Manchester.

Essex. — Private A and QS to be appointed in connection with scheme for adding kitchen and dining room at Shenfield CofE (aided) prim. sch.

Essex.—Further Education building programme 1957-8 to be submitted to MofE, as follows:—(i) South-East Essex Technical College (a) First instalment of South-East Essex county technical sch., £171,000; (b) extensions for printing accommodation, £47,000; (ii) Mid-Essex Technical College.—Reorganisation, £50,000; (iii) Hornchurch Ardleigh House. —Accommodation for day release classes, £64,000; (iv) South-West Essex Technical College.—Extensions, £105,000; (v) Braintree College of Further Education.—Second instalment, £206,000; (vi) Harlow College of Further Education.—Additional instalment, £142,000.

Essex.—Adaptation of property known as Kingswode Hoe, Colchester, to serve as day special sch. for 100 ESN children, to be included in 1957-58 programme.—Loan sanction, £217,219, to be sought for building work, etc., at Hornchurch Abbs Cross County sec./tech. sch.

Fleetwood.—BC to invite tenders for 48 houses.

Gosforth, Northumberland.—J. Rowell & Son, Ltd., Gateshead, have submitted proposals to local authority for development of land in Jubilee-rd. by erection of four shops and flat, filling station with 38 lock-up garages, licensed premises, cinema, and bowling green. A: Cackett, Burns Dick & Mackellar (F), 21, Ellison-pl., Newcastle upon Tyne.—UDC approved revised lay-out plans for 32 acres of land for housing developments at Regent Farm Estate for M. J. Liddell & Son, builders, Great North-rd., Newcastle.

Gosport.—HC recommends approval of lay-out plan for 170 dwellings at Rowner No. 2 estate and invitation of tenders for first 150 (two- and three-bedroomed types) at early date. —HC recommends invitation of tenders for 22 single-storey dwellings at Crossway.

Guisborough.—G. G. Pace (F), St. Williams's College, York, is architect for alterations and additions to Sir William Turner's Hospital, Kirkleatham.

Halesowen.—TC approved plans for extensions to factory at Manor-la. for L. Shelley, Ltd.

Hindley.—M of W to commence work shortly on erection of new prison.

Houghton-le-Spring.—UDC has approved £12,000 scheme prepared by S for public hall. —S to prepare scheme for construction of Council depot.

Keighley.—TC seeks loan £31,178 for new library at site of Lowfield House.—Approved plans: 20 houses at Queens-rd., Hemsby-grove and Eaton-st. for F. W. Heaton, Ltd.

Keighley.—Baptist Authorities and Church of England Authorities propose erection of new Churches at Bracken Bank estate.

Lanchester.—RDC to build 30 houses at Lanchester and 14 at Esh Winning. Plans by S.

Leamington Spa.—42 acres of land behind Northumberland-rd., including part of Brookhurst golf course, have been purchased by Morris and Jacombs, Hobmoor-rd., Small Heath, Birmingham, for erection of 180 houses estimated to cost £5,000 each.

Leeds.—TC approved layout for 46 dwellings at Cardigan-la. and 28 flats at Grosvenor-rd.

Litherland.—UDC to prepare plans for erection of shops at Norwood-ave.

Manchester.—New RC Church of St. Annes at Crescent-rd. and Crescent-ave., Crumpsall, for RC Diocese of Salford. A: Greenhalgh & Williams (L/A), 15, Mawdesley-st., Bolton.—Three-storey block of 22 flats at Wythenshawe-rd., Northenden, for D. Jones. A: Major Bull, 91, High-st., Cheadle.

Middlesbrough.—EC expects to obtain tenders by end of July for erection of Prissick Farm No. 1 county sec. sch. Plans by Education A.—J. G. L. Poulson (L), 171, Albert-rd., appointed architect by EC for proposed additions to College of Art. Reynolds & Scott (F/F), 9, Albert-sq., Manchester, appointed architects for proposed dining room and school meals kitchen at St. Mary's Convent.

Middlesbrough.—Tees Valley Water Board, Corporation-rd., Middlesbrough, to obtain tenders for installation of micro-screening system at Longnewton Reservoir. £90,000 est. Board's Chief E.

Morpeth.—CC plans to build grammar school at Newgate-st. and to replace 400-year-old King Edward VI grammar school by new school. County A, Newcastle.

Newcastle upon Tyne.—Regional Hospital Board's building programme for next two months includes new hospital in West Cumberland, new dept. at Middlesbrough Hospital to cost £90,000, and preservation work at Guisborough Hospital to cost £15,500. Board's Ch.A. —Plans approved for extensions for Handicraft & Supplies, Ltd., Ridley-pl. A: Stephenson & Gillis, Saville-chbrs., Newcastle. —Plans approved for extensions for C.W.S., Ltd., 92, Westmoreland-rd. Architects Dept., 90, Westmoreland-rd.—Plans approved for third stage of new College of Technology, Ellison-pl. City A, 18, Cloth Market.—Start will be made next year with building a library for King's College, double the size of present library, to be followed by new dept. of physics and building for electrical and engineering.—City Health Committee is seeking 20 acre site at Kenton Bank for public abattoir.—The MofH has approved Newcastle Regional Hospital Board's capital building programme of £1,320,894 for 1956-57.

Northants.—CC proposes new sec. mod. sch. at Wollaston, £100,486 est.; laboratory and classroom at Towcester gram. sch., £10,000 est.; laboratory, 2 classrooms and alterations at Wellingborough Grammar School, £10,000 est.; extensions at Rothwell sec. mod. sch., £38,000 est.; extensions at Thrapston sec. mod. sch., £62,000 est.; extensions to Towcester sec. mod. sch., £62,000 est.

North Riding.—EC to place contract shortly for proposed additions to Yarm grammar sch. School A: D. W. Dickenson, County Hall, Northallerton. QS: Turner & Ing, 2, Garden-st., Darlington.

Notts.—EC proposes following in 1958/9 programme:—Completion of workshop block at Newark County Technical College; phase 4 of extensions at Worksop County Technical College and further development at Hucknall Further Education Centre.

Ripon.—Restoration and repair scheme for Cathedral has been approved. Cost £100,000. Constg. A: Professor Sir Albert Richardson, RA (F). A: Ward, Ruddick & Ward (F/L), The Purey Cust Chbrs., York.

Sheffield.—TC to lease land at Meadow-st. and Hoyle-st. to Shell Mex & BP, Ltd., for erection of warehouse, offices and petrol-filling station and sites at following estates for erection of licensed premises:—Parson Cross estate to Duncan Gilmour & Co., Ltd.; Bowden Houstead estate to S. H. Ward & Co., Ltd.; Basegreen estate to Williams Stones, Ltd.; and Shire Green estate to John Smith's Tadcaster Brewery, Ltd.

Stokesley.—RDC S., W. Burnie, has prepared plans for 32 houses, comprising 20 at Great Ayton, 10 at Yarm, and two at Carlton. Tenders are being obtained.

Sunderland.—River Wear Commissioners have approved schemes for improvements to pier. £169,000 est.

Sunderland.—TC to obtain tenders for three pairs of shops and four pairs of houses at Hylton Castle estate. Plans by Boro' A. QS: T. H. Rae & Partners, 5, Belford-terr., Sunderland.—C. S. Errington, 46, Grainger-st., Newcastle, is A for erection of workshop, stores and offices at North Sands Shipyard for J. L. Thompson & Sons.—TC received loan sanction for £135,897 for Farringdon county prim. sch.—TC to build 12 three-storey flats and quantities being prepared.

Sutton Coldfield.—BC seeks loan sanction £21,817 for building 15 dwellings at Coleshill-rd. for corporation employees.

Sutton Coldfield.—BC to negotiate contract with Butler Bros. (Birmingham), Ltd., 150, Sutton-rd., Birmingham, for erection of 9 flats and 6 houses off Coleshill-rd.

Tynemouth.—New sketch plans will be prepared for 54 flats and maisonettes in five-storey blocks at Tyne-st. to reduce the cost by £150 per dwelling as required by MH&LG. Original tender was £139,062. A: A. K. Tasker & Austin Child (F/F), 25, New Bridge-st., Newcastle upon Tyne.

Wallasey.—BC to prepare plans for 112 maisonettes in four-storey blocks and 42 two-bedroomed flats in 11-storey blocks.

Wallsend.—Boro' C has acquired from War Office gunsite at Low Willington Farm for erection of houses. Boro' S.

Wallsend.—TC has approved site at Kings-rd. for extensions to factory of Monitor Patent Safety Devices, Ltd.

Warrington.—J. R. Ashall, Ltd., propose erection of private houses at Appleton, £5,000 each approx.

Warwickshire.—EC seeks Ministry approval for following in 1957-8 programme:—Extensions at Nuneaton Manor Park county sec. sch., £40,000 est.; Bulkington C of E junior, £54,200 est.; Abbotts Farm county infants', Rugby, £42,300 est.; third instalment of Nicholas Chamberlaine county sec., Bedworth, £120,000 est.; second instalment of Polesworth county sec., £45,000 est.; extensions at Hugh Clopton county sec., Stratford-on-Avon, £60,000 est.; Kingshurst RC jun. and infants', £47,400 est.; Nuneaton South county sec., £108,800 est.; Bilton county jun. and infants', £47,400 est.; Camp Hill county infants', Nuneaton, £42,300 est.; new hall and staff accommodation at George-st. county sch., Bedworth, £13,000 est.; two classrooms at Kingsbury county, £10,000 est.; two additional classrooms at Lillington county infants', £10,000 est. S. N.

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Cooke & Ptnrs. (F/F), 34, Harborne-rd., Edgbaston, Birmingham, are A for proposed Leamington Dormer RC sec. sch.—EC to negotiate tender with Geo. Wimpey & Co., Ltd., London, for second instalment of Nuneaton day special sch., £12,800 est.

Wellingborough.—Wellingborough Iron Co., Ltd., Finedon-rd., propose new laboratory at Nest-la.

West Hartlepool.—EC is planning erection of prim. and sec. schs. at Seaton Carew where extensive housing developments are taking place. Committee intends including college of further education in its 1958-59 building programme. Boro' A: A. G. Sinclair (A).

Whitchurch, Salop.—UDC to acquire "Pauls Moss," Dodington, for adaptation as council offices.

Whitley Bay.—Local Social Service Council expects to start work in autumn on construction of community hall at junction of Park-rd. and Beech-ave. £10,000 est. E. Roberts, Boro' E., to prepare plans.

Wigan.—TC approved in principal new fire station, drill tower and yard at rear of Ormskirk-rd., Newtown.

TENDERS

* Denotes *accepted.*
† Denotes *provisionally accepted.*
‡ Denotes *recommended for acceptance.*
§ Denotes *accepted subject to modification.*
¶ Denotes *accepted by H.M. Government Departments.*

Bebington.—44 houses at Teehey-la. estate, Higher Bebington, for BC. BE&S: T. H. McGrath, BEng, AMICE, Municipal Offices. *Gregory Construction (North Western), Ltd., 37, Hope-st., Liverpool, 1, £60,512.

Birmingham.—New factory at Stour-st., Ladywood, for Stern & Bell, Ltd. *C. Bryant & Son, Ltd., Small Heath, Birmingham.

Bletchley—Erection of factory No. 10 at Council's Industrial estate off Watling-st., for UDC. E&S: J. F. Smithie, AIMunE, Council Offices. QS: T. C. Hadland & Ptnrs. *Gilham & Horsman, Ltd., 154, Bletchley-rd., Bletchley, £14,559 (subject to approval of Ministry).

Chorley.—Extensions to factory, for Leyland Motors, Ltd. *Leyland Construction Co., Ltd., Wellfield Hough-la., Leyland.

Crewe.—7 shops, 4 flats and 14 garages at Wistaston Green estate, for TC. *Allman Bros., Newcastle, Staffs, £18,591.

Eccles.—New metallurgical block at Green-la., for Mitchell Shackleton & Co., Ltd. *Ernest Tonge & Sons, Ltd., Swinton.

Glasgow.—Five-storey block of buildings at London-rd., for Great Universal Stores, Ltd., Universal-hse., Swallow-pl., W1. A: George Watt (A), 146, Mostyn-rd., Merton Park, SW19. Principal contrs.: *Thaw & Campbell, Ltd., 130, Paton-st., Dennistoun, Glasgow, EC2.

Glasgow.—Additions and alterations at their Sauchiehall-st. buildings, for Woodhouse & Co., Ltd., warehousemen. A: Wright & Kirkwood (F/A), 9, Woodside-pl., Glasgow, C3. Principal contrs.: *Peter Thaw & Co., Ltd., Duke-st., Glasgow, E1.

Glasgow.—25 houses at Maxwell-drive, Pollockshields. A: Norman Macfadzean (F), 137, West Regent-st., Glasgow. Principal contrs.: *John Lawrence (Glasgow), Ltd., West Regent-st., WC2.

Glasgow.—14 semi-detached bungalows at Simshill. A: John C. C. Munro (F), 141, West George-st., Glasgow. Principal contrs.: *Mactaggart & Mickle, Ltd., 107, West Regent-st., Glasgow, WC2.

Glasgow.—New buildings at Lochburn-rd., Possilpark, for Cooper, Macdougall & Robertson, Ltd. *Kelvin Construction Co., Ltd., Lochburn-rd., Glasgow, NW2.

Glasgow.—New buildings for Millburn Motors, Ltd., to be erected at a Dennistoun site. Principal contrs.: *James W. Connell (Engineers), Ltd., Lanarkshire Works, Coatbridge.

Keighley.—90 three-storey flats at Braithwaite estate, for TC. *Unity Structures, Ltd., London, £122,099.

Lancs.—Following, for CC:—Skelmersdale sec. mod. sch. *R. Costain & Sons (Liverpool), Ltd., Barlows-la., Fazackerley, Liverpool; Atherton Green Hall day special sch. *T. Collier & Sons, Ltd., Brown-st. Works, Leigh.

Lincoln (Kesteven).—First instalment, sec. mod. sch. at Market Deeping, for EC. County A: J. W. H. Barnes (F), Sleaford. QS: K. H. Bole, FRICS: *Bosworth & Wakeford, Ltd., Daventry, Northants, £120,980.

Lincoln (Kesteven).—County sec. mod. sch., "The Grove," Earlesfield, Grantham, for CC. CountyA: J. W. H. Barnes (F), Sleaford. QS: K. H. Bole, FRICS: *Rudd & Son, Ltd., Wharf-rd., Grantham, £171,501.

Llanelly.—Raising of height of dams and reconstruction of bridges at upper and lower reservoirs at Lleidi, for BC. Cons. engrs.: T. & C. Hawsley, 1, Gt. Scotland-yd., SW1. *Davies, Middleton & Davies, Ltd., Phoenix Works, Caerphilly-rd., Cardiff, £15,000.

¶**London (Admiralty).**—Particulars of contracts over £1,000 in value:—*Lancs*: Steelwork and foundations, *British Insulated Callenders Construction Co., Ltd., 30, Leicester-sq., WC2. *Devon*: Building work, *J. W. Spencer, Ltd., St. Lawrence-yard, North Hill, Plymouth. *Kent*: Building work, *G. E. Wallis & Sons, Ltd., 231, Strand, WC2; Crane track, etc., *Concrete Piling Ltd., 10, Westminster Palace-gdns., SW1; road surfacing, *W. H. Bensted & Son (Contractors), Ltd., Coombe Quarries, Maidstone, Kent. *Hants*: Insulation lining to roofs. *Tentest Fibre Board Co., Ltd., Fiboard-hse., Oakleigh-gdns., Whetstone, N20. *Surrey*: Building work, *Riley & Wishaw, Ltd., Petworth-rd., Haslemere, Surrey. *Yorkshire*: Roadworks, *J. Pullan & Sons, Ltd., Beeston, Leeds, 11.

¶**London (Air Ministry).**—New works contracts to value of £500 or over for fortnight ended May 26:—

Building work: *Walter G. Birch (Harrogate), Ltd., Montpellier-ho., Harrogate, Yorks; *F. Shepherd & Son, Ltd., Blue Bridge-la., York; *Stanley Hugh Leach, Ltd., 231/231a, Yeading-la., Hayes, Middx.; *A. J. Dunning & Sons (Weyhill), Ltd., Weyhill, Hants; *William T. Nicholls, Ltd., St. Paul's-rd., Gloucester. *Artificers' work*: *Willcocks & Stephens, Ltd., Lower Polshan-rd., Paignton, Devon; *F. Shepherd & Son, Ltd., Blue Bridge-la., York; *W. H. Streeter, Ltd., Tudor-rd. Works, Hampton, Middx; *Bosworth Wakeford, Ltd., New-st., Daventry, Northants. *Redgra playing and track area*: *The Pipewell Ploughing Co., Ltd., 1, Middle Pavement, Nottingham. *New pavements and resurfacing*: *Crowley Russel & Co., Ltd., 16, Blythswood-sq., Glasgow, C2; *Tarslag, Ltd., Tees Bridge, Stockton-on-Tees; *W. J. R. Watson, Ltd., 81, Great King-st., Edinburgh, 3. *Building work*: *Taylor Woodrow Construction, Ltd., Ruislip-rd., Southall, Middx; *A. Monk & Co., Ltd., Padgate, Warrington, Lancs.

London (British Railways).—Contracts let by London Midland Region:—*R. Skevington & Sons, Keys-st., Derby; labour only for cleaning and painting Toton depot, Derby "H" stores, West Hallam station, Derby (Nottingham-rd.) station.—*Normanton Jones, Ltd., 167, Plymouth-grove, Manchester, 13; general repairs to boundary wall, Palmerston-st., Ashton Old-rd.—*Edward Wood & Sons, Ltd., Park-st., Derby; alterations to existing lavatory accommodation and construction of sewage disposal units at Beeston sidings.—*E. Fox, Ltd., Evington-st., Leicester; meeting-room and pay office at motive power depot, Leicester London-rd.—*C. Booth & Son, Ltd., Hamilton-hse., Bidborough-st., WC1; new signal box at St. Pancras.—*Trinidad Lake Asphalt Co. (North Western), Ltd., India-bldgs., Water-st., Liverpool 2: cold asphalt surfacing of sett-paved roadways at Preston Butler-st., goods depot.—*Leonard Fairclough, Ltd., 3, Chapel-st., Adlington, Lancs; renewal of superstructure to engine shed at Longsight South motive power depot.—*Brightside Heating & Engineering Co., Ltd., 17, Summer-row, Birmingham, 3; improved amenities, heating and hot water services at Bescot motive power depot.

¶**London (Metropolitan Police).**—Sundry works at Horniman-dr., Forest Hill, SE: *H. Randell & Son, Ltd., £1,352.

¶**London (MOW).**—Contracts placed for week ending May 19:—

Berkshire: AWRE Aldermaston, Building A.37.1, special fume cupboards, *Matthew Hall & Co., Ltd., Matthew Hall-ho., Dorset-sq., N.W.1. *Buckinghamshire:* Teachers' Training College, Bletchley Park, Bletchley, adaptations for new assembly hall, *C. E. Ivens & Son, Ltd., Northampton-rd., Lichborough, Towcester. *Cheshire:* Birkenhead TE, Palm-gr., Claughton, Birkenhead, erection of lateral extension, *John McGeoch & Sons, Ltd., Arbour-la., Kirkby Trading Estate, Kirkby, Liverpool. *Flintshire:* Ministry of Health Polish Hospital, Penley, upgrading of living accommodation, *E. W. Gittins & Sons, Ltd., Foundry-bldgs., Johnstown, Wrexham. *Hampshire:* Post Office, Lower-rd., Bemerton, Salisbury, adaptations for workshop, stores and garage, *T. & D. Lucas, 147, Castle-st., Salisbury; Idminston, Porton, erection of 18 houses and external works and services, *W. E. Chivers & Sons, Ltd., Devizes, Wilts. *Lanarkshire:* PO Central TRS, Pitt-st., Glasgow, extension, *Stuart Construction, Ltd., 7, Fitzroy-pl., Sauchiehall-st., Glasgow, C3. *Leicestershire:* Humberstone (Leicester) TE, extension and alterations, *Walter Potter & Sons (Contrs.), Ltd., Grasmore-st., Leicester. *Montgomeryshire:* White Castle, Llantillio Crossenny, footbridge, *John Perkins & Son, Ltd., St. Marks-rd., Easton, Bristol 5. *Yorkshire:* Temporary office building, Halton, Leeds, alterations to Wing "A," *C. J. Tomlinson, 23, Beckett-st., Leeds 9.

¶**London (War Dept.).**—Works contracts placed in week ended May 19:—*Berkshire*: Painting, *Decorative Painting Contrs., Ltd., Hounslow. *Derbyshire*: Miscellaneous, *H. J. Warner, Ltd., Derby. *Dorset*: Painting and decorating, *Deeds (Builders), Ltd., Hounslow; roadwork, *Mendip Stone & Concrete Co., Ltd., Frome. *Essex*: Civil engineering, *W. & C. French, Ltd., Buckhurst Hill. *Glamorganshire*: Miscellaneous, *P. Gaylard & Son, Ltd., Bridgend. *Herefordshire*: Fencing, *Ankerdine (Public Works), Ltd., Worcester; painting and decorating, hutting, *General Industrial Roofing and Construction Co., Ltd., Birmingham. *Leicestershire*: Roadwork, *Constable Hart & Co., Ltd., Derby. *London*: Roofing work, *J. J. Etdridge, Jnr., Ltd., London; building work, *Ferris Bros., London; cleaning moat, *Grant & Ptnrs., Ltd., London. *Middlesex*: Electrical installation, *Freeman Electrical Co. (London), Ltd., London. *Nottinghamshire*: Building work, *J. Scarson, Ltd., Sutton-in-Ashfield. *Staffordshire*: Miscellaneous, *R. J. Russell, Wolverhampton.

Middlesbrough.—Supply and erection of structural steelwork for proposed Prissick Farm No. 1 county sec. sch., for EC. *James Ellis & Co., Ltd., Newcastle upon Tyne, £11,597.

Newport, Mon.—Saw, stretcher and tank foundations for Northern Aluminium Co. building scheme at Rogerstone. *Davies, Middleton & Davies, Ltd., Phoenix Works, Caerphilly-rd., Cardiff, £29,000.

Northallerton.—Erection of nurses' recreation hall at Friarage Hospital, for Newcastle Regional Hospital Board. Board's Ch. A. *R. E. Coleman, Ltd., Western Hill, Durham, £12,582.

Nottingham.—New barrack blocks, etc., at Bestwood Lodge, for War Dept. *W. J. Simms, Son & Cooke, Ltd., Haydn-rd., Nottingham.

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Penistone.—24 flats at Shrewsbury-rd. estate, for UDC. *Hey & Murfin, Summer-la., Wombwell, £29,243.

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Sheffield.—Block of 4 shops and maisonettes and block of 6 single-storey shops at Greenhill-Bradway estate, for TC. *Ackroyd & Abbott, Ltd., Sheffield, £26,868.—Reinstatement of nurses' home at Leicester General Hospital, for Regional Hospital Board. *Tarratt Bros., Ltd., 28, Brandon-st., Leicester.

Sheffield.—Superstructure of Hemsworth county sch., for EC. *Vic Hallam, Ltd., Langley Mill, Notts, £27,330.

South Shields.—New factory at Bede trading estate, for Fry's Die Castings, Ltd. A: Geo. H. Gray & Ptnrs., 52, Camden-st., North Shields. *Thomas Clements & Sons, Selborne-gdns., Newcastle upon Tyne.

Stanford-le-Hope, Essex. — New central laboratories building at Coryton, for Mobil Oil Co., Ltd., Caxton-ho., SW1. Main contrs.: *John Laing & Son, Ltd., Mill Hill, NW7.

Sunderland.—16 houses, for TC. *J. W. Ridley, Ltd., Southwick, Sunderland, £17,204.

Sunderland.—Site development works at Lawrence-st. clearance area, for TC. *D. & J. Crombie, Ltd., Back Alfred-st., Deptford, Sunderland, £62,189.

Sunderland.—Erection of 12 houses, for TC. *G. H. Plemper, Ltd., Old Chester-rd., Sunderland, £12,224.

Sutton, Surrey.—Extension to premises of George Doland, Ltd., 60, High-st., Sutton. QS: Johnston Evans & Co., 5, Watford-way, Hendon, NW4. *Frank R. Freeman, Ltd., 13-14, Chapel-st., NW1.

Swansea.—New sheet pile at wharf at Queens Dock, for Prince of Wales Dry Dock Co. *Davies, Middleton & Davies, Ltd., Phoenix Works, Caerphilly-rd., Cardiff, £38,500.

Swansea.—Demolition of oil bunker jetty and construction of box pile dolphins. Constg. engrs.: Rendel, Palmer & Tritton, 125, Victoria-st., SW1: *Davies, Middleton & Davies, Ltd., Phoenix Works, Caerphilly-rd., Cardiff, £29,000.

Tillycoultry.—14 four-apartment houses at North West Development site. Principal contrs.: *Weirs Housing Corpn., Ltd., Calder-st., Whifflet, Coatbridge.

Tynemouth.—36 houses at North Shields, for TC. *J. H. Rodgers, North Shields, £41,521.

Warwickshire.—Following, for CC:—Balsall Common sec. sch. *Geo. Wimpey & Co., Ltd., London, £111,984; Exhall jun. sch. *W. H. Jones & Son, Ltd., Lockhurst-la., Coventry, £54,539; Gaydon prim. sch. *Hinkins & Frewin, Ltd., Canal-st., Oxford, £38,154.

Westminster.—Rebuilding of bomb-destroyed St. Andrew's Home and Club for Boys, Great Peter-st., SW1, for General Committee, 50, Tufton-st., SW1. A: A. Llewellyn Smith & A. B. Waters (F/F), 103, Old Brompton-rd., SW7. QS: Watkins & Decker, 13, Gray's Inn-sq., WC1. *E. H. Burgess, Ltd., 34, Grosvenor-gdns., SW1, £35,000 (approx.).

Wood Green.—40 maisonettes at Crescent Rise housing site, for BC: *Cawood, Wharton and Co., Ltd., Crouch Hall-rd., Crouch End, N8, £93,951.

Worcestershire. — Extensions at Pershore county sec. sch., for CC. *Perks Bros., Church-st., Eckington, £12,993.

Wortley.—24 flats and 14 garages at Lane End estate, for RDC. *J. F. Finnegan & Co. (Sheffield), Ltd., 847, Eccleshall-rd., Sheffield, 11.

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